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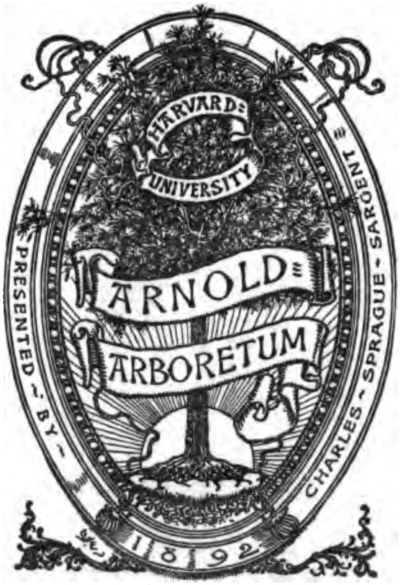

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THE DISTRIBUTION OF SOFTWOOD LUMBER IN THE MIDDLE WEST.

WHOLESALE DISTRIBUTION.

STUDIES OF THE LUMBER INDUSTRY.

PART VIII.

BY

OVID M. BUTLER,
Assistant Director, Forest Products Laboratory.

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THE DISTRIBUTION OF SOFTWOOD LUMBER IN THE MIDDLE WEST.

WHOLESALE DISTRIBUTION.

BY OVID M. BUTLER, *Assistant Director, Forest Products Laboratory.*

FOREWORD.

Lumber distribution is a vital part of the lumber industry. It directly influences the mill prices received by the manufacturer and the final prices paid by the consumer. Manufacturing costs have been studied intensively by lumbermen individually and by lumber associations, with the result that manufacturing problems are generally known and widely understood. Lumber distribution, on the other hand, is a field in which no systematic or intensive studies have heretofore been made. Few data of a complete or exhaustive nature are available, and the costs and conditions of distribution are incompletely understood except by those engaged in the distributing processes.

Distributing agencies are the only part of the industry with which the great bulk of lumber consumers come into contact. The general public is more immediately interested in the distribution of lumber than in its manufacture, not only because it deals with distributors and not manufacturers, but because it knows the methods, efficiency, and organization of distribution have much to do with the price of lumber and with the services rendered by the industry to the consumers of its products. On the other hand, many manufacturers of lumber have laid the ills of the industry largely to faulty and inefficient distribution. The manufacturing branch of the industry needs to know more intimately the conditions prevailing in the distribution of its products and to have a better understanding of their bearing upon general industrial problems. In short, distribution is a middle link involving the interests and needs of both producers and consumers.

A study of the methods, costs, and tendencies in distributing lumber was essential, therefore, to obtain a clear understanding of the conditions and problems of the industry as a whole. It was impossible to extend this study of distribution with any adequate degree of intensiveness over the entire United States. The inquiry was therefore confined to eleven of the Central States, as shown on the map (fig. 1), page 4; and because of the limited period and working force available, together with the unexplored nature of the field, the investigation should be considered as preliminary in character.

The middle western region was chosen because of its active and well-developed lumber trade; because of its consumption of lumber

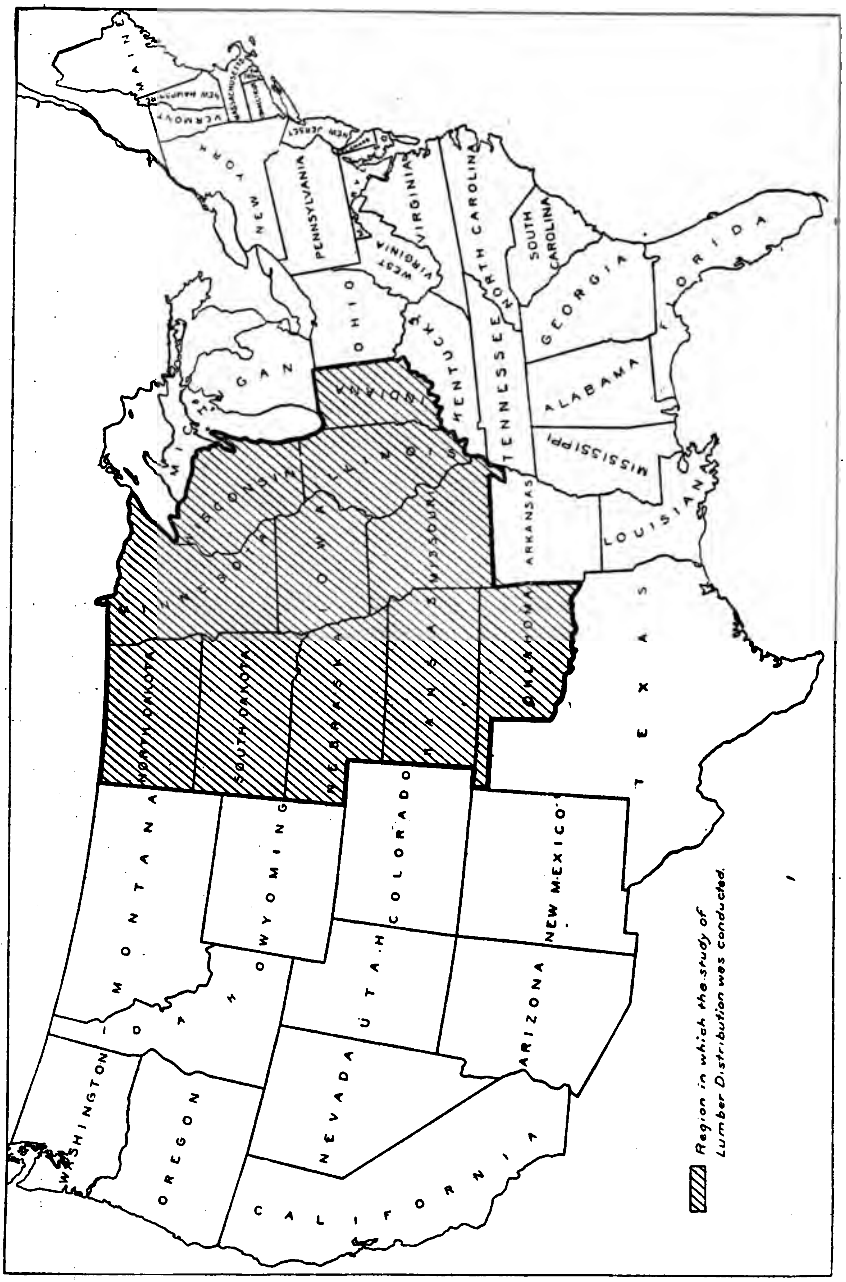


FIG. 1.—Region in which study of lumber distribution was conducted.

for many varied uses by railroads, factories, cities, towns, and large rural districts; because the various types of distributing organizations and methods are probably better represented and more fully developed in these States than in any other section of the country, and because by reason of its geographical location it represents most clearly the trade conditions arising from the consumption of lumber produced in different regions. It is probable that the Middle West reflects more nearly than any other part of the country the complexity of forces and tendencies which are coming to an increasing degree to characterize the lumber trade of the United States.

This survey was designed to cover only the economics of lumber distribution. It did not attempt to study general forms of business organization, particularly cooperative organizations. It made no specific inquiry into the influence, intent, or policy of associations of lumber dealers or manufacturers, or the extent and effect of efforts to "classify" the trade and otherwise restrain or regulate competition. The references to these matters are based upon general information obtained by the Forest Service, including the results of the investigation of the lumber industry conducted by the Bureau of Corporations. They are inserted to convey, as far as possible, a just and balanced view of the whole situation.

WHOLESALING CONDITIONS IN THE MIDDLE WEST.

The clear-cut channels of trade in lumber which characterized the Middle West 20 or 30 years ago have to a considerable extent been broken up by the cross currents of rapid and complex industrial development. White pine of the North is now but one of some 10 or 15 species from which the consumer may select. Substitutes for lumber, aggressively merchandized, also intensify competition and add to the pressure on the wholesale market.

Wholesaling is an essential process in lumber distribution, and the type of organization best adapted to different conditions of trade will undoubtedly be determined not so much by small differences in cost as by efficiency and service. The many types of wholesaling organizations include lumber manufacturers, selling agencies, independent wholesalers, brokers, commission men, and catalogue houses. Most small mills are dependent on middlemen for marketing their lumber and often for financial assistance.

Railroads, large construction companies, wood-using factories, and retailers are the principal wholesale buyers of lumber. The bulk of it is bought on the current market under conditions as complex as those existing in the selling end. Wholesale buyers are often able to whipsaw one seller against another, particularly during periods of depression, and in other ways exert strong downward pressure upon wholesale prices. During the past 10 years the trend in buying appears to have been in favor of transactions direct with the mill, especially in the case of retail lumber dealers and railroads.

Wholesale distribution embraces the sale and handling of lumber in the bulk. It puts the product of the sawmills into the hands of consumers who buy in relatively large quantities and of retailers who redistribute in smaller amounts. In wholesale distribution, therefore, there are two distinct factors—(1) sale transactions and (2) transportation.

Strictly considered, wholesale distribution begins at the mill yard, but it is the general custom to consider the cost of loading lumber into freight cars as a mill cost. For this reason, lumber on cars at the mill, freight unpaid, has been taken as the point at which distribution begins.

WHOLESALING CONDITIONS FROM 1880 TO 1910.

In 1880 Chicago was, as it is to-day, the largest lumber-distributing point of the Middle West. The northern mills, which at that period furnished practically all the softwood lumber consumed in the Central States, shipped their output to Chicago, whose location, with respect to water and rail traffic, made it the gateway to the consuming territory. At Chicago this lumber was sold by commission houses to large local wholesale yards, and in turn distributed throughout the Middle Western States to country retail yards. Channels of trade were clear cut. Lumber was in strong demand, and the manufacturer was required to give comparatively little attention to the sale of his product.

The methods employed in the wholesale merchandising of lumber have undergone many changes during the last 35 years. These include changes in the source of the timber supply and in the character and development of transportation, the introduction and competition of new woods, changing and highly specialized demands of wood users, the increasing number of patterns and grades in lumber, and the competition of other building materials.

As railroad transportation was extended and cutting operations in the North moved more and more to the interior regions of Michigan, Wisconsin, and Minnesota, the practice of shipping direct to country and city yards naturally developed wherever rail facilities permitted. This led to a gradual shrinkage in the volume of northern pine passing through Chicago and to the establishment by the wholesale or concentration yards at Chicago of branch yards at other central points as a means of more direct handling of lumber. As consuming points in the Central States became more directly connected by rail with the producing regions, however, the need of large central yards gradually diminished and selling by wholesalers and jobbers located at the larger cities, who simply billed the lumber direct from mill to consuming points, came into general practice.

The shipment of large quantities of southern yellow pine into the central region and the great development of rail transportation following 1890 brought about a rapid increase in the number of lumber wholesalers and jobbers and marked the beginning of competition between pine lumber from the North and pine lumber from the South. Despite these changes, the channels of trade, enforced to some extent by cooperative regulation, remained clearly established, and the output of the mills passed largely through the hands of wholesalers and jobbers. Following 1900 the number of different kinds of softwood shipped into the region increased rapidly. Hemlock from the Lake States, Douglas fir from the Pacific Coast, and western pine from the Inland Empire became strong competitors of the northern and southern pine in parts of the middle western territory, while at the same time there was a great increase in the production of hardwoods. The decade ending 1910 witnessed the heavy introduction of many different woods into the region, bringing about keen competition between different species, and, following 1907, stocks of lumber in excess of the demand.

During the same period the increase in the number of wholesalers and jobbers, far in excess of the increase in the amount of lumber produced, tended to intensify competition in the wholesale market. A further source of competition developed to large proportions in the great increase in other building materials placed upon the market. From many causes the period was one developing competitive tendencies to a high degree. From a lumber-merchandising standpoint it marks a breaking away from established channels of trade and trade classifications, with the gradual growth of complex and diversified methods of wholesale merchandising which characterize the trade to-day and are described in the following paragraphs.

In former years there were many concerted attempts by associations of lumber retailers, separately or in conjunction with manufacturers, to control the competition of wholesale sellers by a "classification" of the trade. These classifications were partially effective, though subject to many local exceptions and variations. During the last six years or more they have been breaking down, partly as the result of public opinion and the action of public agencies, but more largely from competitive pressure within the industry itself. While the dictates of "trade ethics" as between wholesaler and retailer are still recognized to some extent, lumber-trade tendencies in the Middle West as a whole have been away from restrictions upon competition.

WHOLESALE SELLERS OF LUMBER.

MANUFACTURERS' SALES DEPARTMENT.

Lumbermen have been slow to recognize that wood was being forced from a position where it virtually sold itself because of its ready availability, cheapness, and universal use as a building material to a position requiring the highest type of salesmanship. This has been due primarily to the fact that acute conditions have come very rapidly, that lumbermen have given more attention to timber investments and to logging and manufacturing than to distribution, and that the average millman has apparently been unmindful of the rapid development of competitors in the building-material field. Despite depressed conditions extending over the greater portion of the last 10 years, it is only within the past two or three years that concerted action has been taken to develop lumber merchandising on a scale comparable with the methods already developed in marketing many other building materials.

From a position of relative unimportance in years past, lumber merchandising has thus become one of the most vital problems of the manufacturer's business. The changing conditions described have compelled him to give more and more attention to the sale of his product. The large manufacturer no longer depends upon the disposal of his entire output through wholesalers, jobbers, and commission men, or through salesmen of the class employed 15 or 20 years ago, who usually were scarcely more than order takers. The value of his plant as an asset is measured largely by his ability to sell his output within a reasonable time and at profitable prices. This problem has been at its worst during the periods of depression which have characterized the trade during the past 10 years. Competition from an increasing number of species seeking markets, an increasing number of mills and middlemen, an increasing number of substitutes for wood, and finally, a relative decline in the demand for lumber, has forced upon lumber manufacturers the development of sales organizations and sales policies of assured efficiency. This statement applies more particularly to the small percentage of large mills which have an output sufficient to maintain separate sales organizations.

The growth in the practice of many mills, particularly in the South, of selling direct to large consumers and retail dealers has been keenly felt by the wholesalers and jobbers. Figures obtained from wood-using factories, retail dealers, and railroads in the Central States, given on pages 24 and 25, show that in this wholesale market to-day the greatest volume of sales is made by mills through their own sales departments and traveling salesmen. Viewed in the light of conditions obtaining 15 or 20 years ago, these figures are significant of the growing competition between middlemen and large operators.

Selling organizations have been developed further by large manufacturers in the South than in the Douglas fir region of the West Coast. A study of selling methods indicates that approximately 60 per cent of the output of the Douglas fir mills is sold by wholesalers and commission men, 20 per cent through manufacturers' agencies, and 20 per cent by the mills direct. In the case of southern pine these figures are reversed. Sixty per cent of the output and over is sold by large mills directly through their own selling organizations. It should be held in mind that the figures obtained from factories, retailers, and railroads were returns from companies operating in a region which is predominantly a yellow-pine territory.

Some mills follow a policy of selling exclusively through their own salesmen and sales departments; others sell only through wholesalers and commission men; others sell both through their own organization, mill agencies, wholesalers, and commission men. In actual practice, particularly in times of stress, however, mills will sell through any channel yielding the required price.

Merchandising through the manufacturer's own organization is carried on by three broad methods: (1) By selling offices and traveling salesmen; (2) by local mill representatives; (3) by mail. Large mills as a rule sell a part of their output through salesmen who travel throughout the consuming territory. Selling organizations and policies, however, are subject to many variations. In some cases but one selling office is maintained, either at the mill or at a central market point; in other cases two or more selling offices are located in different market regions, with salesmen "on the road" operating from each. These selling departments may be operated at cost or on a specified margin per thousand feet. In the latter case they are often required to show a profit upon the year's business, this being the difference between the margin allowed for selling and its actual cost. In some cases these selling offices are operated as separate companies, the interlocking relationship varying from practically no control to absolute control of the mill by the sales company, or vice versa. Such sales offices may handle lumber from other sources also, thus engaging in a general wholesale business. Special concessions in price are, however, often granted by their own mills.

Another method of direct wholesaling by the manufacturer is through local mill representatives. This plan is usually followed by mills which are far from the market and find it advisable to have an agent in the market in order that they may be kept informed of its conditions and requirements. Such a representative is sometimes a salaried employee of the company but is often paid only on the volume of business which he develops. He is therefore independent in many respects and may often handle products of several mills. As a rule he deals in the higher grades of lumber and therefore caters to a rather special trade.

Selling by mail is of course incidental to all wholesaling, and a great volume of business is transacted through this medium alone. The term as used here refers to transactions wherein the business is obtained and handled by mail. The procedure consists simply in sending out to both wholesalers and consumers a list of stock on hand with the prices at which it can be purchased. The customer or dealer looks over the stock sheets as they are received and orders anything thereon which he wishes at the price quoted. This practice is common with both large and small mills.

Aside from a number of large catalogue houses which transact both a wholesale and retail business, selling exclusively by mail on the part of manufacturers is limited almost entirely to small mills. During periods of depression, when sales of lumber are slack, the mailing of stock sheets from both small and large mills assumes large proportions and contributes to instability in market prices. Wholesalers as well as buying retailers and large consumers compare the prices quoted by a large number of mills and select the lowest offers. In times of depression mills often quote prices at less than cost in order to obtain immediately funds to continue operations. This practice places the advantage in the hands of the buyers, whose selection of low orders, if in heavy volume, tends to force down the wholesale price.

Selling by mail is, of course, an economical process, but under existing competitive conditions its use as the only method of disposing of mill outputs is clearly restricted by its lack of selling force.

Opinions on the part of lumber manufacturers who are in a position to develop selling organizations of their own vary widely as to the most efficient method of merchandising. The mill maintaining its own selling department claims decided advantages in the merchandising field under conditions existing to-day. This method enables the mill to control the marketing of its own product and to come into contact with its customers and their requirements. By being able to exercise direct control over the sale of his product, the manufacturer undoubtedly occupies a position of greater safety than where the disposal of his entire output and the success of his plant depend upon middlemen. It further enables him to control prices better and to meet competition more intelligently by keeping in close touch with market conditions and by eliminating middlemen's profits which tend to lower the f. o. b. mill price. Furthermore, wholesaling through his own organization assures the manufacturer that his product will not be subject to grade manipulation by unscrupulous middlemen and enables him to develop a reputation for the quality of his stock, business policies, and standards of manufacture.

From the standpoint of service to the consumer, it is open to question whether the method has advantages except in so far as it protects him against irresponsible wholesalers and assures him more uniform stock through his knowledge of the mill with which he is dealing and the quality of its products. On the other hand, the particular mill with which the consumer is dealing may be unable to fill his order immediately; and time and money may be lost in locating and getting the material from other sources. During periods of normal business it requires from three to four weeks for lumber to reach the wholesale consumer after it has been ordered. Delays often arise to lengthen this interval, such as the misrouting of cars, car shortage, etc. If the mill with which the order is placed is short of the stock desired, additional time may be lost to the purchaser unless he is in close touch with mill stocks generally. If the mill has no local agent or salesmen in the territory, the distance between the mill and the consumer is often a disadvantage to both, particularly in the case of complaints, credits, or misunderstandings.

In point of price, direct trade has obvious possibilities of gain to the buyer. In a competitive market the mills are normally in a position to underquote the wholesale broker, particularly on large orders or term contracts; and there is the further opportunity to obtain low rates in direct sales from competing mills.

MIDDLEMEN.

(1) WHOLESALERS.

Wholesalers of lumber are of three classes—wholesalers without yards, wholesalers with yards, and commission men. The jobber and wholesaler may for all practical purposes be considered identical, and the two terms are here used interchangeably as applied to independent wholesaling units. The distinction is largely obliterated in practice, since the business transacted is essentially the same and the same company may transact both a wholesale and jobbing business in the strict sense of the term. It should be borne in mind also that lumber wholesalers commonly handle a certain amount of business on a commission basis, and that in large cities a retail, wholesale, and commission lumber business is often conducted by the same company. Hence a clear-cut line between the classes of dealers does not always exist.

The organization of the wholesaler consists of an office at one or more places in the consuming territory, and traveling salesmen and commission men if the volume of business is sufficiently large. The larger wholesale companies often maintain buying offices in regions producing the species which they handle in greatest volume. The assets required of the wholesaler who establishes a permanent and responsible business are capital, a knowledge of markets and market requirements, buying and selling responsibility, and familiarity with the conditions and methods of manufacture of the various woods.

The primary function of the wholesaler is of course to market lumber upon a large scale, serving the manufacturers as a seller of their products and the large consumer and retail dealer as a buyer of stock required in their businesses.

Manufacturers make either current sales to wholesalers or contracts covering a given period. Some mills, for example, enter into contracts with wholesalers for the disposal of a stated feetage annually, paying an agreed price per thousand feet or per car for selling. Other mills simply sell a part or all of their product to wholesalers at a given amount off the mill price. Concessions in price made to wholesalers by the mills vary in different producing regions and often between manufacturers in the same region. In the Douglas fir territory the common practice on the part of mills is to sell to the wholesaler at

$0.50 per thousand feet less than the current wholesale market price for common grades and $1 per thousand feet less in the case of upper grades. In the Inland Empire the mills ordinarily grant the wholesalers a reduction of $1 per thousand feet, while in the South concessions range from $0.50 to $1.50 per thousand feet.

These differences appear to be due primarily to differences in the value of the lumber. Large mills in some instances will not make a lower price to the wholesaler than to a regular large customer. Such mills, however, have strong selling organizations and are engaged in direct competition with the independent wholesaler. Under these conditions it is not uncommon for the mills to grant the wholesale consumer or the retail dealer a lower price than they will quote the wholesale dealer. Again, some mills are more strict with wholesalers in their terms of sale, requiring a sight draft for 80 per cent with the bill of lading and discounting 2 per cent in 10 days only; while in the case of sales to retail dealers or the factory trade the common practice is to allow a 2 per cent discount within 10 or 15 days after the arrival of the car, and net payment within 60 days. Large mills having no sales organization and small mills depending entirely upon the wholesaler for the disposal of their product ordinarily cooperate with the wholesaler and respect his trade territory.

At the present time the output of small mills, with the exception of that consumed locally, is sold generally by wholesalers and commission men. These mills are not financially able to maintain their own selling organizations and are, therefore, dependent upon middlemen for the disposal of their products in the general market.

With the development of extensive sales departments by many large mills, the value of the wholesaler from their standpoint has decreased, and many such mills oppose his existence. This opposition arises from various sources. In some regions it is based primarily upon the fact that the wholesaler is the outlet of the small mill, one of the factors most disturbing to price stability. These mills may place lumber upon the market at almost any price during periods of depression, and close down when necessary, but spring up in great numbers during periods of prosperity. From the standpoint of the large mill they are disturbing competitors, despite the fact that the volume of lumber produced by them is relatively small.

Some mills further oppose the wholesaler because he is not conducive to as close contact between producer and consumer as they desire. In selling through a wholesaler the mill ordinarily does not know to whom its product goes or the price paid for it, while the consumer does not know the mill from which he obtains his lumber or the price received by the mill. Wholesalers have consistently opposed efforts on the part of the manufacturer or consumer to ascertain the destination or source of lumber sold through them.

This is, of course, a protective measure on their part to prevent direct transactions between the consumer and the mill.

Another objection to the wholesaler common among the mills is inability on the part of the manufacturer to control the marketing of his product and the price at which it is sold. These objections, however, in the final analysis lead back to competition and its resultant practices. Lumber must be sold; the more wholesalers and mill salesmen, the keener the competitive tendencies. Under intense competition the manufacturer who can not exercise direct control over the men marketing his product necessarily feels less independence than the manufacturer who employs his own salesmen.

Notwithstanding the opposition of many large manufacturers, not less than 90 per cent of the mills in operation to-day depend upon the middleman to a greater or less extent for the disposal of their product. According to figures obtained by the Forest Service (Bulletin 506, Production of Lumber, Lath, and Shingles in 1915), the number of mills in that year producing 10,000,000 feet and over annually was less than 3 per cent of the total number in operation, and it would be a manifest error to assume that all of these mills sold their output through their own salesmen or selling agencies. In point of volume, however, these mills produced 56 per cent of the total output; and, as has already been pointed out, recent figures obtained for the Central States show that the greater volume of lumber is bought direct from the mill by retailers and large consumers. It will be clear, however, that any move looking to the elimination of the middleman by the large mills must take into consideration, among other things, the economic place of the small mill and the problem of marketing its output.

In addition to his function as a distributer, the wholesaler is of direct financial service to the small mill in a great number of cases, and not infrequently to large mills. It is a more or less common practice for him to advance 75 or 80 per cent of the cost of the lumber to the mill upon receipt of the invoice. Small mills, as a rule, are not financially strong enough to hold their lumber, but must ship it as soon as cut and obtain some money on it immediately in order to continue operations. This practice is another source of opposition to the wholesaler by some large mill owners, under the belief that there are too many small mills, and that if this system of financing were not practiced by the wholesalers the number of small mills would be reduced. Wholesalers also finance retailers in some instances, either directly or through credit arrangements, thus contributing to financial stability.

A further service performed by the wholesaler is that of handling accounts for the mills which he represents. Wholesalers, as a rule, discount their bills to the mill and then assume the risk and expense of collection from the customer. In this way the mill is relieved of the trouble and expense incident to carrying and collecting accounts and of losses from bad accounts. In the final cost of distribution, however, this is simply a shifting of the cost from one unit to another.

From the standpoint of both consumer and producer, the wholesaler has many advantages in large-scale lumber merchandising. Being located in the consuming district, he can often learn the consumer's needs more thoroughly than can the mill salesman who covers large territories. With this knowledge of consumer's requirements, he may often locate a stock of the required quality at lower prices.

The wholesaler's position enables him to keep in close touch with the stocks on hand at various mills and thus to meet the demands of his customers with certainty and promptness. He can further keep in closer personal contact with market prices than the mill and can, as a rule, be more aggressive in competition than the mill salesman, who is bound, ordinarily, by price instructions from his employer. By representing various mills, the wholesaler has at his disposal a large variety of stock and is enabled to meet a great variety of demand promptly. Often he can place orders to the direct advantage of the mills. He can often handle large orders, which one mill could not meet, by division among several mills. Being on the ground, he is in a position to represent both mill and consumer in cases of complaint, particularly where the mill is not in an organization having an inspection department. Instances were found where buyers preferred to deal through wholesalers because the latter would relieve them of all trouble incident to complaints arising with the mill.

On the other hand, the position of the wholesaler opens many opportunities for unscrupulous practices through his knowledge of the consumer's ignorance, by manipulating grades, changing invoices, and charging unreasonable prices. He is also in a position in many cases to take advantage of the small mill with which he is dealing. These small mills often meet financial embarrassments, especially during periods of depression, which put the wholesaler in a position to force them to sell below cost of production in order to obtain money immediately. By thus obtaining lumber at an abnormally low price the wholesaler may undersell on the general market or make unreasonable profits. Even though the number of such sales may not be great, they are, nevertheless, a disturbing factor with respect to stable market prices.

Wholesalers, as a rule, do not desire to see the market price of lumber reduced, and their efforts, as a whole, are to maintain good prices. In practically every large center there are a limited number of wholesalers, however, who are always seeking business at any price which will net them a small profit. In fact, many of them often take business at cost or at a slight loss simply for competitive satisfaction or because of ignorance of their own selling costs. Buyers sometimes complain of the tendency of some wholesalers to speculate by accepting an order at a given price and then endeavoring to locate low offerings, thereby entailing delay to the purchaser and in many cases delivering poor stock. The failure of many wholesalers to give the service to both manufacturer and consumer which their position makes possible, combined with the practices of irresponsible dealers, is undoubtedly responsible in part for the growth of direct trade between the large consumer or retail dealer and the mill.

(2) WHOLESALE YARDS.

The wholesaler who in connection with his regular selling business operates a yard at which he carries a stock of material available for distribution upon short notice renders primarily the service of economical assemblage at a central point and prompt delivery of special stock required in limited amounts by outlying yards or large-scale users. Through this service retail yards favorably located with respect to the wholesale yard can obtain in mixed carloads, with practically no delay, stock of different species manufactured in many different regions. In the case of retail yards located at the same point, the stock can be obtained immediately by team delivery. They are thereby saved the necessity of carrying large stocks in these items over long periods.

These wholesale yards, when situated at favorable railway transfer points, often do a lumber-storage business either for the mills or for other wholesalers. This consists simply of storing the lumber until it is sold, when it is reshipped to the point of final destination. Established storage rates are charged by the wholesale yard. The arrangement is especially advantageous in enabling the mill or wholesaler to meet an urgent delivery order, particularly where the lumber must otherwise undergo long shipments, as when Douglas fir is sold in southern Wisconsin.

The business available to wholesale yards is thus of a special nature and more or less limited. As is shown later in this report, it is also much more costly to transact by reason of additional handling of the lumber and the greater investment required. The amount of lumber which passes through wholesale yards in the Middle West compared with the total amount moving is relatively small.

(3) COMMISSION MEN.

The commission man merchandises for the mill on an agreed charge per unit of quantity. No standard commission is fixed in actual practice. In some cases it is based on the thousand-feet unit, in other cases upon the carload. Some mills have a sliding scale of commissions based upon the grade and value of the lumber sold. Usually, although not always, the commission man's organization is small and he works as an individual, particularly where his business is exclusively on commissions.

Wholesalers, both large and small, ordinarily combine a commission business with their wholesale business, sometimes on a large scale. Wholesalers often employ commission men at distant points and pay them an agreed division of the commission which the mills grant them. A great deal of Douglas fir is sold in the Central States and the East by this arrangement. In large cities it is not uncommon for retail dealers to handle a small amount of wholesale and commission business in connection with their retail operations.

One of the most common complaints against commission men by the mills is their unfamiliarity with manufacturing conditions and the failure of many of them to protect the interests of the manufacturer by endeavoring to maintain staple prices, adjust complaints, etc. The method of paying commissions on a volume basis is conducive to their selling as much lumber as possible regardless of price, with the resulting tendency to force down the f. o. b. mill price; and to their pushing the sale of lumber regardless of its most economical use or of market conditions.

SELLING AGENCIES.

The mill selling agency is of comparatively recent origin in lumber distribution, its existence dating from about 1900. The objects of the selling agencies which have thus far engaged in lumber merchandising have been essentially the same, although their methods have been different and the success attained has varied.

One of the most successful selling agencies operating in the central region is the Louisiana Red Cypress Co. This company was incorporated under the laws of Louisiana in 1907 to do a wholesale lumber business, with an authorized capital of $1,000,000. It contracts the entire output of 14 or 15 cypress sawmills in Louisiana at specified prices, with a provision that these prices may be changed from time to time as actual market conditions justify. These contracts are made for one year's output of the mills, but with a provision that they are continuing contracts unless one party or the other desires to abrogate them by 30 days' notice in writing.

Under their contracts the mills give the company a discount on the mill value of the product sold, which has varied somewhat, but for several years has remained at 6 per cent.

The agency, however, buys outright the lumber, lath, and shingles contracted, and resells them at such prices as it sees fit. It also buys and sells some stock manufactured by outside mills. The company assumes all the risks of bad debts, discounts, and other losses incident to the business, in the same manner as an ordinary wholesale concern. It advertises in the lumber-trade papers and a few periodicals issued by industrial firms. It also keeps a large force of salaried salesmen in the field, soliciting business and advocating the use of cypress.

The California Sugar and White Pine Co., another successful selling agency, is one which handles from 60,000,000 to 80,000,000 feet of California pine yearly, marketing approximately 80 per cent east of the Rocky Mountains and approximately 15 per cent in foreign trade. The agency was organized in 1901 primarily to introduce the higher grades of California pine in the eastern markets. To-day approximately 50 per cent of the cut of No. 2 Shop and better grades of California pine is sold through the agency. Its stock is held by individuals and companies, some of whom contract for the sale of their product through the agency. The holding of stock, however, is not necessary to obtain the services of the company. It contracts with individual operators for the sale of their product of No. 2 Shop and higher grades at market prices, less 7 per cent brokerage, and 2 per cent discount for cash within 15 days from date of shipment. This contract provides that the operator may sell any of the grades involved, provided their sale has not already been contracted by the agency.

A third selling agency was formed in 1915 by a number of mills in the Inland Empire. It is called the Idaho White Pine Manufacturers' Agency, and consists simply of salaried representatives employed jointly by these mills to sell a part of their product. At the beginning of each year the constituent mills agree upon the per centage of their cut which will be handled through the agency, and the current business is distributed as nearly as possible to conform with this agreed division. Necessary readjustments are made at the end of the year on the basis of actual sales. Costs are defrayed on a percentage of the amounts sold for the different companies. The agency maintains an office in Chicago and is supposed to handle the business of its mills east of the Mississippi River, selling direct to retailers as well as wholesalers.

The California Pine Box and Lumber Co. is a selling medium for box shooks in California. It is a stock company, organized in 1901, and sells for any mill on a commission basis. In 1914 the company sold and shipped 170,000,000 feet of box shooks, over 95 per cent being marketed in California. This represented the output of about 20 mills in California, 2 in Oregon, and 2 in Arizona, and constituted approximately 75 per cent of the shooks sold in California.

A number of mill agencies have been established in the Douglas fir region and have operated with varying degrees of success. Some of them have disbanded, but several agencies are in operation to-day.

These agencies represent from 6 to 20 mills each. The largest agency organized in the Douglas fir region, however, The Douglas Fir Sales Co., ceased to operate as an agency after four years. The failure was attributed by those interested to the shrinkage in the price of lumber during 1914, which resulted in rather heavy losses in current operations and in overshipments to the Chicago market. During periods when business was good this agency had 16 salesmen in the field, and its sales averaged approximately 200,000,000 feet per year.

The objects of the mill agency are to concentrate the business of selling under expert direction and thereby reduce selling costs and increase merchandising efficiency; to provide the mills with the machinery for controlling the marketing of all or part of their output, and the handling of large orders which a single mill can not fill; to provide cooperative means for small mills, not financially able to maintain extensive sales organizations, to market their product effectively; and, finally, to eliminate duplication and competition in obtaining business.

In other words, the agency seeks to make a group of mills as effective a selling and competing unit in the markets of the world as possible. It may introduce new competitive factors into existing markets. It endeavors to stabilize mill prices, not necessarily to increase the prices paid by consumers. It is of special advantage to small mills whose marketing facilities are poor. The necessity for the selling organization to keep in close touch with manufacturing conditions at its plants tends to limit successful agencies to those serving a small group of mills or handling special grades of lumber which require intensive merchandising.

One of the principal difficulties experienced by the softwood mill agencies, which appears to have worked against their complete success, has been the failure of the mills fully to support them. This is true not only of mills in the producing region but of the constituent mills actually represented by the agency. This lack of support appears to arise in part from the suspicion of constituent mills with respect to the control exercised by one another in the operations of the agency, and in part from the pressure upon many plants to realize upon their lumber stocks during periods of depression. In short, many agencies have lacked a strong organization capable of controlling the sales of their mills and of adapting manufacturing practice to the markets actually developed.

There seems little doubt that centralized wholesaling of the products of the lumber mills can be more cheaply conducted than under their present diversified methods and duplicating organizations; but the system, should it dominate lumber distribution, contains possibilities of unreasonable restraints upon competition unless regulated by the State or Federal Government.

COMPLEXITY OF WHOLESALING CHANNELS.

This description is intended to give a general picture of the wholesaling channels in the lumber trade. Figure 2 illustrates their complexity. It should be borne in mind that each of these methods is subject to many modifications, since each seller develops his business along the lines suggested by local circumstances. Consequently the

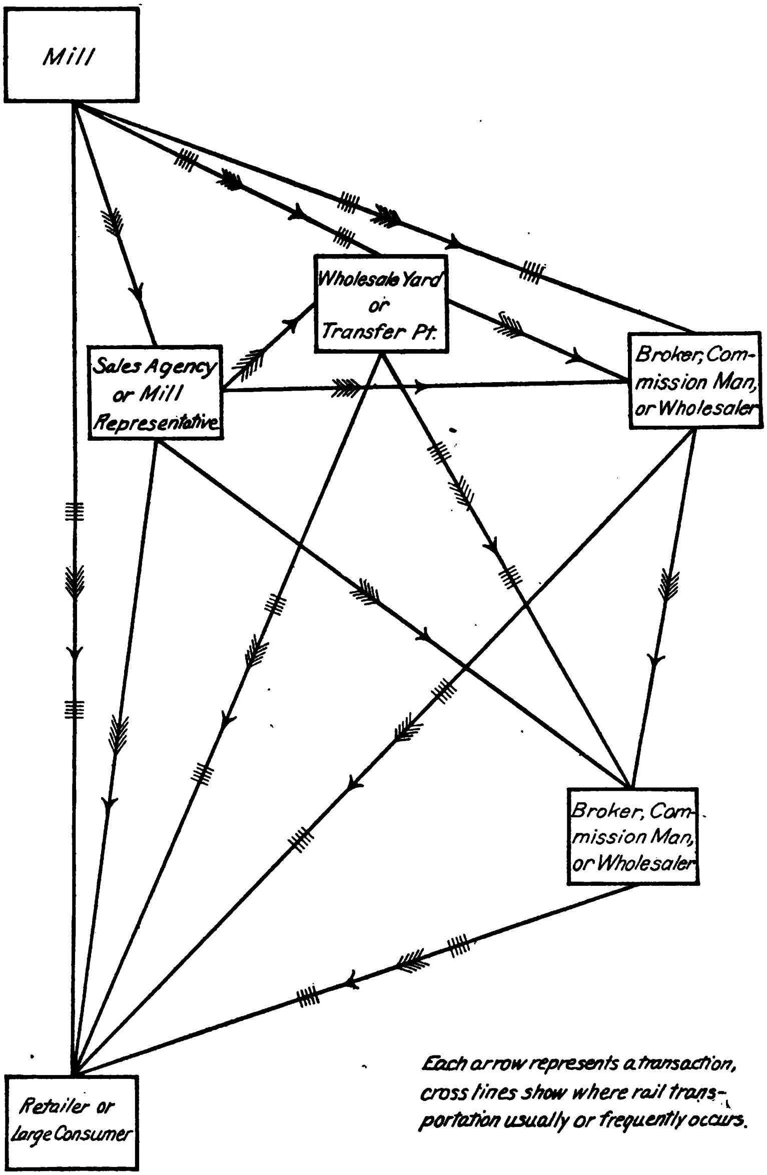

Mill
Wholesale Yard or Transfer Pt.
Sales Agency or Mill Representative
Broker, Commission Man, or Wholesaler
Broker, Commission Man, or Wholesaler
Retailer or Large Consumer
Each arrow represents a transaction, cross lines show where rail transportation usually or frequently occurs.

FIG. 2.—Channels of wholesale distribution of lumber.

same organization commonly uses several different methods. This diagram brings out the two distinct factors of (1) sale transactions and (2) transportation in the wholesale distribution of lumber. The number of times a carload of lumber may be sold in its passage from the sawmill to a retail lumber yard is striking. Instances of lumber shipments passing through the hands of several different middlemen were disclosed in the course of this study; but a relatively small part of the total volume of lumber moving passes through the hands of more than one intermediary—sales agency or wholesaler—and an increasing proportion of the output is wholesaled directly by the mill. Nevertheless, as long as the machinery for duplication in selling is present, a varying percentage of sales will be so handled.

The same is true of the number of times freight is paid upon a car of lumber. Competitive pressure is tending steadily to restrict rehandling and reshipping; and an increasing part of the lumber cut is transported direct from manufacturer to retailer or large consumer, whatever agencies may participate in its sale. Nevertheless, with the duplicating machinery of distribution striving to maintain itself, a small percentage of the lumber consumed is reshipped several times.

WHOLESALE BUYING.

THE WHOLESALE BUYER.

Wholesale consumers of lumber may be roughly classified as railroads, large construction companies, and wood-using factories which remanufacture for further sale. Wood-using factories, while not consumers in the usual meaning of the term, are so designated in this report for convenience.

In actual practice no hard-and-fast rule defines a wholesale buyer. Those who use lumber in carloads or cargoes more or less continuously are ordinarily considered legitimate wholesale buyers by the trade. Custom and competitive conditions at different points, however, are large factors; and any definition attempting to specify those who have bought at wholesale prices under the conditions of trade existing during the past few years is subject to many local exceptions and variations. This is due primarily to the many sources through which lumber is being sold to-day and the resulting competition between wholesale and retail sellers. For example, at some points small wood-using factories which require several carloads of lumber annually may be found buying at retail prices; at other points factories whose wood requirements are similar buy at wholesale prices; some cities which use lumber in large amounts buy their bills at wholesale prices, others buy all their requirements from the retail trade; small contractors as a rule buy at retail prices, although a limited number can be found at various points buying at wholesale. During periods of depression, when competition is intensive, the usual channels of trade in many communities become more or less obliterated through the efforts of mills and wholesale dealers to obtain business previously handled by the retail trade. During the past five years the wholesale lumber trade in the Middle West has been more variable and irregular as the result of these conditions than in any other period in the history of the industry.

The great diversity and complexity in selling methods applies equally to buying methods. Wholesale lumber buyers are of many kinds—long-term and short-term buyers, emergency or current buyers, quality buyers, price buyers, and speculative buyers.

Long-term buyers are found among both large and small purchasers. The usual method is to contract at a certain time of the year for the requirements during the coming 12 months or longer, celivery being made as specified during the period covered by the dontract. Such buying is of course economical from a cost standdoint and has a distinct advantage in enabling both producer and consumer to figure on a definite volume at fixed prices. Another advantage of the long-term contract is that it gives the mill ample time to deliver the stock; and this usually means well manufactured, dry lumber, an important item to the remanufacturer and likewise to the mill in the matter of freight charges incurred in shipping. Again, in favor of the mill is that during periods when prices drop to a low level or orders are slack, it can turn to the manufacture of material under contract at fair prices instead of continuing the production of low-priced current stock or reducing its capacity from lack of orders. On the other hand, if prices rise generally this advantage is reversed.

Contract buying is thus more or less speculative for both buyer and seller, due to fluctuations in the price of lumber. This is its disadvantage, for when current prices rise well above the contract rate the buyer is frequently required to push the mill for the manufacture of his stock. Where the parties to a long-term contract are unreliable, market fluctuations often result in breaking the contract, which in many cases is followed by lawsuit. Long-term contracts involving the immediate delivery of a large part or all of the material needed during a year involve the tying up of large amounts of money. This practice is restricted largely to the factory trade. Under reasonably uniform market prices, however, there is no doubt that contract buying would be the most economical method of merchandizing to classes of trade which can forecast their future requirements. Short-term contracts are usually for 90 to 120 days, and to a lesser degree are subject to the same advantages and disadvantages.

The more common practice in the wholesale trade is to buy at current market prices, specifying either immediate or future delivery. This buying is heaviest, not during periods of low market prices, but during a rising market. Periods of low lumber prices have been times of general business depression, when building operations are restricted and the demand for lumber is at low ebb. As general business conditions improve, the consumption of lumber increases, accompanied by an upward trend in price and active buying by both consumers and dealers. Uncertainty as to future demands and requirements and fluctuations in the price of lumber are the primary reasons why current buying is considered more satisfactory by the majority of buyers.

Buying and holding lumber in the wholesale market purely as a speculative measure is not commonly practiced. It involves buying heavily on a low market and holding the material for a rise in price. Extensive storage facilities and financial resources are necessary on the part of the buyer to carry material during the period of depression. Since depressions in lumber prices have often extended over considerable periods, holding charges are liable to more than offset the subsequent rise in price. From the standpoint of the mill, buying of this nature is often of advantage in moving stock and in making money available at a time when it is most needed. It is sometimes of advantage to the wholesale consumer and retail dealer in furnishing better-seasoned stock and immediate delivery at times when lumber prices go up and mill stocks are apt to be low.

Two main buying policies are followed by lumber purchasers, and these are so closely related as to be difficult to distinguish clearly. These two policies are (1) quality buying and (2) price buying. Price buyers are more common among those who buy for remanufacturing purposes, but who make a large number of products, among those who buy to resell, and among wholesale consumers whose requirements are not strict as to quality. The remanufacturer who makes many products is a price buyer as a rule because he is not concerned with the waste problem to any great degree, his business being so adjusted that he can rework his stock closely to obtain the quality of lumber adapted to various purposes. Middlemen catering to trade which is not strict as to grades also usually buy on price.

The transit-car business is to a large extent a "price" trade, particularly during periods of depression, when it assumes marked proportions in some of the central cities like Chicago. This practice, as referred to here, consists of shipping carloads of lumber before any sale has been made, the shipper or buying dealer depending upon effecting its sale before it reaches the original destination. It may be diverted in transit or reconsigned in order to provide the seller more time in which to locate a buyer. The practice has developed to large proportions in the past 10 years, due in part to the need of small mills to move their stock immediately in order to obtain money. If orders are not available, the millman consigns his lumber by carloads as manufactured to dealers at large market points with instructions to sell at or near a given price. Dealers handling transit cars often have many cars en route or in the railroad yards, which they are pressed to sell, divert, or reconsign before demurrage charges accrue. Once demurrage charges begin, a price must be named to effect a sale. In the meantime, however, the millmen may have secured money to continue operations by borrowing from local banks on the cars of lumber shipped.

The quality of the lumber entering into the transit-car business is as a rule below the average, due to uncertainties regarding the price at which it will be sold. Few instances were encountered where wholesale buyers who consider quality to any extent in their purchases accepted transit-car material. On the other hand, buyers looking for cheap lumber and not particular as to quality frequently turn to transit cars. Many mills, especially large ones, refuse to ship transit cars because of the demoralizing effect of the practice on the market and its tendency to create car shortages. Small mills and wholesalers, on the other hand, quite generally engage in the transit-car trade.

Price buying, whether of the transit-car type or otherwise, particularly buying which sacrifices quality, is distinctly bad from the standpoint of the consumer and manufacturer in that it tends toward grade substitution and the demoralization of grade standards. Furthermore, price buying contributes directly to instability in the current market.

Quality buying is more common among factories which manufacture but a few products. Sash, door, and blind factories, for example, are usually quality buyers because clear lumber is necessary in the manufacture of their products and buying material on a quality rather than a price basis is considered economical when freight rates, labor, handling, and standards of products are taken into account. One of the principal problems which sash, door, and blind manufacturers have to deal with is the elimination of waste. Manufacturers who do not make veneered doors, for example, are unable to use anything but practically clear stock. In order to reduce their waste to a minimum they must buy material which will give them the largest number of clear cuttings of girth size. Manufacturers who are able to utilize their waste in cores of veneered doors do not find it necessary to be so rigid in their specifications and can consequently afford to buy more on a price basis.

On the other hand, some sash, door, and blind factories buy for price as a matter of business policy, figuring that it is more economical to buy a lower quality of material at a lower price and, by reworking it, obtain the clear cuttings required in their business. It is simply a question of whether the increased cost of freight, rehandling, and reworking of the low-quality material, combined with the loss from waste, are offset by its lower price.

Railroads in buying much of their car material and construction companies in the use of structural timbers are necessarily quality buyers, as are middlemen who supply a trade of specific requirements.

In all buying it should be borne in mind that price and quality can not be clearly separated, since it is a matter of getting the quality of material desired at the best price obtainable. During the last few years the large buyer as a rule has had the advantage over the seller and has undoubtedly had a depressing influence upon wholesale lumber prices. Lumber buyers whose purchases were reviewed invariably believed that they were buying lumber at lower prices than their competitors; but a comparison of buying prices brought out the fact that during the period studied there was little difference in the price at which lumber has been obtained by large buyers who have been in a position to follow the market closely and to whipsaw one seller against another.

THE TREND IN BUYING.

In order to determine the sources through which the wholesale buying of lumber is most largely handled to-day, inquiries were sent to the principal railroads, to retail dealers, to sash, door, and blind manufacturers, to box manufacturers, and to a limited number of furniture and miscellaneous manufacturers throughout the Middle West. These wholesale buyers were asked to give the channels through which they were buying their timber.

In all classes of organizations the replies indicate a great variety of methods. For all businesses, however, the greatest volume of lumber was found to bought from the mill direct. The figures submitted by 21 of the largest railroad systems in the Central States showed that approximately 78 per cent of their purchases are placed direct with the mills or their selling representatives. Several of the roads buy practically their entire requirements from the mills; the remainder buy in varying proportions from wholesalers and from mills. Amounts ranging from 1 to 5 per cent are obtained from retailers, but such purchases are for local emergencies only. Four of the roads buy their western lumber from the mill or mill representatives only and their southern lumber from wholesalers, this plan having proved satisfactory by experience. One road refuses to buy through commission men, preferring to deal with those who actually purchase lumber from the mill on its order or with the mill direct.

Railroads are largely current buyers, although some of them follow a policy of contracting for six months' requirements, especially on a rising market, and in the case of special material, such as ties, they often place their contracts covering their needs for a year or longer.

Over half of the companies report that within the past five years they have changed their policy to deal more directly with the mills. In point of obtaining both grade and price, the weight of the data is in favor of the mills, although several railroads consider that they obtain better prices and service from wholesalers.

In the factory trade of the Central States, the data indicate that while buying is done more largely through wholesalers and commission men than in the case of railroads, the greater proportion is obtained through direct orders upon the mills. Reports from 132 factories, most of which were sash, door, interior finish, and box manufacturers, showed that approximately 60 per cent of the material was obtained upon direct purchase from the mill. As between the different factories, however, there were such wide variations in methods and sources of buying that the above figure should be considered as merely indicative. For example, 13 of the factories buy through wholesalers or commission men exclusively, 37 buy direct from the mill, and the remainder buy in varying proportions from all sources, adjusting their policy to the source and methods by which their diversified requirements are most satisfactorily met.

In the retail trade of the central region, buying directly from the mill appears to be more extensive than in either the railroad or factory trade. This is especially true of the line yard companies. Based on statements from 549 companies, the buying showed, in point of volume, 80 per cent purchased from the mills and 20 per cent purchased through wholesalers. These yards were distributed throughout the States of Kansas, Iowa, Missouri, Minnesota, North and South Dakota, Indiana, Wisconsin, and Oklahoma, and the averages given apply to both individual and line yards. Considering the yards separately, the returns showed that in the case of individual dealers 70 per cent was bought direct from the mills and 30 per cent through wholesalers, while the line yards obtained 90 per cent from the mills and 10 per cent from wholesalers.

The above organizations represent the three largest classes of wholesale lumber consumers, and the information furnished by them indicates quite clearly an increasing tendency during the past few years to deal more directly with the mill. The reasons most generally given are advantages in point of grades, price, delivery, and service. Many replies, however, are conflicting in this regard, indicating that the individual concern dealt with is a large factor. Any application of the data cited to the wholesale trade in regions other than that from which it was obtained is not warranted. It should be borne in mind, further, that the large consumers and retail dealers from whom the data were obtained are mainly users of softwoods. These results can not, therefore, be applied to all classes of trade.

BUYERS' COMPLAINTS.

Complaints between the buyers and sellers of softwood lumber, while fairly numerous, involve but a relatively small per cent of the total volume of lumber sold. Complaints arise primarily from the quality of the material or its condition of manufacture, although in many cases the species of wood and the quantity of material delivered are matters of complaint.

Most of the lumber manufacturers' associations have provided inspection bureaus for facilitating the settlement of complaints arising in the sale of their lumber. These bureaus employ expert graders who reinspect the material when complaints arise. These inspectors do not adjust the complaints, that being left to the shipper and buyer to settle upon the basis of the reinspection or by recourse to the courts. The common practice is for the original invoice to stand if the reinspection does not show a difference greater than 4 or 5 per cent in the volume of grades. If, however, differences exceed the customary percentage, the shipper ordinarily adjusts the matter by allowing the purchaser the degrade at its going market value. The cost of reinspections is, in the majority of associations, charged against the shipper to be adjusted with the consignee. This charge is the expense of reinspection in the case of members of the association, and usually a special charge when the service is extended to nonmembers.

Figures obtained from six of the principal lumber manufacturers' associations show that less than 1 per cent of the total amount of lumber sold annually is reinspected upon complaint and that the cost of this work when charged against the total amount sold is insignificant. It must be borne in mind, however, that figures showing the material actually inspected by the lumber associations are not a true index of the extent to which complaints exist. Reinspections are usually asked only after the shipper and buyer have been unable to settle the claim by other means. Again, dissatisfied buyers in many cases do not ask for reinspection, but simply turn to another seller or to another building material.

A better index of the extent to which lumber is subject to complaints would be the records of the mills which show the percentage of their output upon which complaints are received monthly. Some mills utilize this record as an index of the standards of their grades and regulate current shipments accordingly. For example, if conplaints are made on an amount exceeding a certain figure monthly, it is taken as evidence that the grades have been below standard and shipments for the following months are remedied; if, on the other hand, complaints fall off, it is an indication that the grades shipped are above standard and changes are made accordingly, the policy being to keep grades at a more or less uniform standard.

With the many grades of material which have been made to meet the requirements of different consumers, it is only natural that shipments from time to time will vary in quality; and it is inevitable that differences of opinion will arise, since there are no sharp lines defining the various grades. Expert lumber inspectors themselves often vary in their grading, and the sale of lumber by the grades now established necessarily is a more or less give-and-take understanding between the buyer and seller. Furthermore, the policies of the mills often vary with respect to grades, Some mills furnish a high quality of grade, in many cases better than the grade specifications call for, while others grade to a lower quality, making quite a difference between the average grades put out by different plants. There is usually a corresponding difference in price, but the buyer does not always take this into consideration.

In addition to this looseness or elasticity in the unit of value, which is the grade as well as the thousand feet, other conditions contribute to complaints. These include the lack of responsibility sometimes evident in concerns engaged in wholesaling lumber; manufacturers' ignorance in many instances of buyers' requirements; poor manufacture and seasoning on the part of some mills; the large number of grades and patterns of lumber of different species, which tend to confuse many buyers; ignorance of buyers with respect to grades and grade problems; and the sharp practices of unscrupulous dealers.

At the present time four things are working toward a reduction in the number of complaints arising in the marketing of softwood lumber. They are:

(1) The development of better grades by the mills and associations. This is being done not only by the larger mills themselves but through lumber manufacturers' organizations. The latter's work consists in having its expert graders visit the mills of members of the association for the purpose of checking up the local graders and developing a more expert and standardized grading practice.

(2) The practice followed by some shippers of accompanying their lumber by a certificate of inspection which in effect is a guaranty put on the material by an association that it has been inspected by a licensed inspector and contains the grade or grades invoiced. The association does not guarantee this inspection, but it carries moral weight, and shipments with certificates attached are less subject to complaint.

(3) The movement on the part of certain mills and lumber manufacturers' associations to brand their lumber. This movement is of very recent date and the practice is not yet generally followed. The brand used at the present time is simply a manufacturer's trade-mark. It does not designate the grade, but it should be effective in the

elimination of complaints by placing the responsibility of the mill and the association behind its lumber grades. It further enables the mill and buyer to check the transactions of middlemen.

(4) The competition of different species and of substitutes for lumber in the building-material field. This is a strong influence which, it is safe to say, is the underlying force behind the tendencies already mentioned, and which promises to force better methods of merchandising upon lumber manufacturers to reduce possibilities of complaint to a minimum.

COST OF WHOLESALING.

The expense levied upon lumber by wholesaling is subject to great variation because of the variety of organizations, classes of trade, and conditions governing buying and selling. On softwoods distributed in the Middle West wholesaling appears to levy an average tax of between 75 cents and $1 per thousand feet. The expense is considerably higher on lumber handled through wholesale yards. Differences in selling expense, however, often reflect marked differences in the prices received.

During the past 15 years the increase in the number of wholesalers appears to have been far greater than the increase in the lumber cut, tending to raise selling costs per thousand feet. The wholesale lumber trade is a free-for-all field, with no technical or expert knowledge of lumber as entrance requirements. But consumers are more and more demanding exact information on the different kinds of wood and their best uses, and the competition of other materials has awakened lumbermen to the need of more efficient and exact service to users.

The cost of wholesaling lumber is subject to wide variations, particularly when considered by the 1,000-foot unit. This is due to the many wholesaling methods and types of organizations, the different services rendered by wholesalers, and the multitude of conditions under which various kinds of lumber are sold. For this reason an average cost of wholesaling is very difficult to obtain. Wholesalers, mill men, selling agencies, and commission men do not employ the same methods in the conduct of their business, nor do they keep similar records of cost. A surprisingly large number do not know what it costs them to transact a wholesale lumber business.

Wholesaling costs, to be applied with the greatest degree of accuracy, should be determined for each of the different types of business. This could not be done because of inability to obtain data from a sufficient number of each kind of organization to form an indisputable basis. In many cases the middleman's cost records were incomplete or he refused to cooperate in the study by granting access to his books.

AVERAGE WHOLESALING COSTS.

An effort was made to show as closely as possible the average wholesaling cost incident to the distribution of softwoods from the South, West, and North in the larger cities of the Middle West. The figures presented in Table 1 were obtained from companies engaged in lumber wholesaling in Chicago, St. Louis, Kansas City, and Minneapolis and are broadly representative of the wholesale merchandising of softwoods in the region. The figures are believed to reflect closely the average wholesaling costs in this trade. These companies include wholesaling organizations with direct mill connections as well as concerns which are independent of the mills.

While the total costs of doing a wholesale lumber business may not vary to any great extent from year to year, it should be held in mind that the costs per thousand feet are subject to very wide and sudden variations. This applies not only to months but equally to years; and is due, of course, to fixed charges incident to the business which can not be increased or decreased to meet fluctuations in the volume of business transacted.

TABLE 1.—*Average costs of wholesale lumber merchandizing as determined from 36 annual operations of wholesale companies in Kansas City, St. Louis, Chicago, and Minneapolis (softwood distribution).*

Year.	Average volume of sales.		Average gross profit.			Average operating cost.			Average net profit.			Basis, number of companies.
	M feet.	Dollars.	Total in dollars.	Per cent on sales.	Per M feet.	Total in dollars.	Per cent on sales.	Per M feet.	Total in dollars.	Per cent on sales.	Per M feet.	
1915	107,155	2,412,404	125,279	5.2	$1.17	84,261	3.5	$0.79	41,018	1.7	$0.38	4
1914	66,728	1,482,292	69,062	4.7	1.03	52,884	3.6	.79	16,178	1.1	.24	8
1913	66,356	1,707,284	73,206	4.3	1.10	52,152	3.1	.79	21,054	1.2	.32	9
1912	73,997	2,056,197	86,055	4.2	1.16	63,447	3.1	.86	22,607	1.1	.31	6
1911	93,383	2,230,750	94,585	4.2	1.01	72,040	3.2	.77	22,545	1.0	.24	4
1910	146,251	3,511,112	149,827	4.3	1.02	110,289	3.1	.75	39,538	1.1	.27	3
1909	150,909	2,983,969	148,308	5.0	.98	118,872	3.9	.78	29,436	1.1	.20	1
1908	111,371	2,052,053	111,028	5.4	.99	91,320	4.4	.81	19,708	1.0	.18	1
Average of total	85,505	2,047,307	92,110	4.5	1.08	67,761	3.3	.79	24,349	1.2	.28	36
Gross total	3,078,196	73,703,041	......	....	....	......	....	....	......	....	....	....
Average selling price f. o. b. delivered	....	23.94	......	....	....	......	....	....	......	....	....	....
Freight actually paid on	2,758,917	$6.78, or 28 per cent.	......	....	....	......	....	....	......	....	....	....

Table 1 is based on an aggregate of 36 annual operations of 9 different wholesalers. The figures apply only to a direct wholesale business, and not to handling lumber through wholesale yards. The years 1913 and 1914 represent the largest number of companies. The figures for 1908 and 1909 are based on one company's operations and should not, therefore, be given the same weight as the data for the following years. The total amount of lumber sold in the operations represented in the table is 3,078,196,000 board feet.

From the table it might appear that the costs of wholesaling follow more or less uniform standards. An analysis of the figures obtained from different companies, however, shows the opposite to be the case. The smallest amount sold by any company in any one year was 15,398,000 feet. Two of the companies handled each year over 150,000,000 feet each, and in one year one of these companies handled approximately 250,000,000 feet. The sales of the remaining companies fluctuated yearly from 15,000,000 to 50,000,000 feet. The average volume of business shown by the table, therefore, is influenced by the inclusion of two companies which handled a very large volume and is high as applied to most of the companies. The total selling price of the lumber handled by these companies amounted to $73,703,041, which represents an average delivered wholesale price of $23.94.

Wide variations are likewise characteristic of the gross profit shown by different companies. It will be noted that the average gross profit is 4.5 per cent on sales. As between the different companies in different years, however, gross profits ranged from less than 2.9 per cent to 7.5 per cent in one instance. Most of them fell, however, between 3 and 5 per cent. Even greater variation was shown in the gross profit per thousand feet, which ranged from $0.59 in one instance to $2.05 in another. The largest number, however, fell around $1, with a resulting average of $1.08.

The average operating cost is 3.3 per cent of the sales. In this item also great variation was found, both in the percentage cost of conducting a wholesale business and in the cost per thousand feet. On a percentage basis the cost ranged from 1.7 to 7.7 per cent. The cost per thousand feet varied from $0.38 to $1.50. The second highest cost was $1.32 per thousand feet, and with two exceptions the remainder were less than $1. An analysis of these costs does not indicate that a large wholesaling company operates any cheaper than a small company. The data are not conclusive on this point, but the lowest operating costs given are for a company handling a relatively small volume of business. A direct comparison of selling costs between different companies is not warranted unless the methods of selling and all other factors of organization, trades catered to, etc., are taken into consideration. A company disposing of the bulk of its stock through mail lists obviously has an insignificant selling cost as compared with the company employing a large force of salesmen and specializing in certain trades. Increased selling costs, therefore, do not necessarily mean lack of efficiency, since the companies showing the higher selling costs are very apt to show a higher price received for their lumber. It is to a large extent a question of spending more money to seek out special trade or special classes of customers and thereby obtain better average prices.

The variations mentioned under gross profit and operating costs extend into the net profit item, which in percentage on sales ranged from a loss of 1.1 per cent to a gain of 4.2 per cent. Expressed in cents per thousand feet, these ranged from a loss of practically 14 cents in one instance to a gain of $1.12 in an exceptional case. The majority of the figures fell between 15 and 40 cents per thousand feet. The variations mentioned are characteristic not only of different companies, but of the same company in different years. For example, the net profit shown by one company for three years was 36, 54, and 40 cents per thousand feet. For another company they were, during a period of five years, 22, 16, 31, 18, and 11 cents per thousand feet. A third company, with a much larger volume of business, showed annual profits of 16, 14, 19, 22, and 17 cents per thousand feet. The wide variations shown in these figures appear to be due primarily to the class of trade sought, although doubtless resulting in part from differences in business organization or efficiency. It should be further noted that while these companies deal primarily in softwoods, a number of them handle a small amount of hardwoods.

COST OF LUMBER WHOLESALING BY MANUFACTURERS.

Figures obtained from a number of southern pine mills which sell a portion of their output through their own organizations indicate similar variations in selling costs, although the average falls somewhat below the figure given above and the range of variation is not so great. The majority of these costs center between 55 and 70 cents per thousand feet. Table 2 gives the different items of expense entering into them:

TABLE 2.—*Different items of expense entering into cost of selling per thousand feet.*

	Mill No. 1.	Mill No. 2.	Mill No. 3.
Office salaries and expenses	$0.0876	$0.085	$0.182
Office traveling		.030	.015
Salesmen's salaries	.0490	.195	.155
Salesmen's expenses	.0318	.188	.124
Rents		.005	.021
Commissions	.4282	.029	.004
Advertising	.0005	.021	.007
Stationery and supplies	.0178	.012	.019
Telephone and telegraph	.0118	.016	.026
Miscellaneous	.0011	.084	.016
Total	.6278	.665	.569

It will be noted that varying proportions were sold by the different companies upon commissions, Mill No. 1 showing a commission charge of $0.428 per thousand feet, as against $0.004 for Mill No. 3. On the other hand, office and salesmen's expense for Mill No. 1 are $0,168 per thousand feet, as compared to $0.476 in the case of Mill No. 3. Mills Nos. 2 and 3 are considered representative of concerns selling primarily through salaried salesmen. Figures for these mills indicate that the average cost of salesmen's salaries and expenses falls between $0.25 and $0.35 per thousand feet.

CONDITIONS AFFECTING COST OF WHOLESALING.

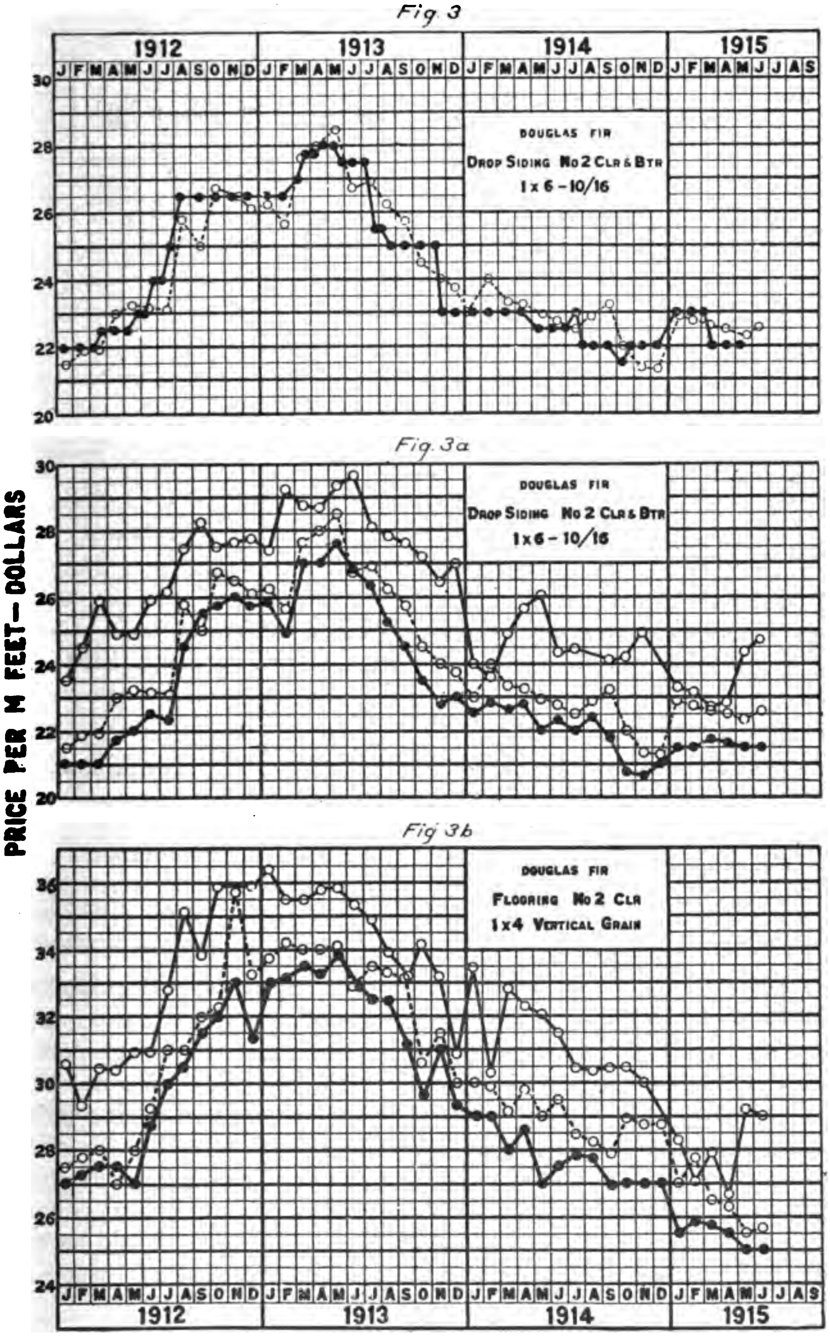
From the variations in costs in operations more or less similar in type it will be apparent that still greater variations must appear when all types of wholesaling operations are considered. Some of the more important factors affecting wholesaling costs are indicated in the following paragraphs.

WHOLESALE YARD OPERATIONS.

It has been indicated that different policies and types of wholesaling organizations have a decided bearing upon the cost of doing business. An extreme example is the difference in cost shown by wholesalers with yards and those without yards. These two types of organizations represent the difference between the actual handling of lumber in large quantities and the simple transaction of its sale. Material which passes through a wholesale yard is, of course, subject to much heavier expense for handling and storage. The wholesaler must, therefore, necessarily charge a higher price for this material than for lumber shipped direct from the mill to the consumer. This is clearly brought out in figure 3, which shows for one large wholesaling concern the average prices at which it bought its stock from the mill and the average monthly selling price on material taken from its yard and on material shipped direct from the mill, respectively. The difference in the two classes of business in point of price is at once apparent. This difference is due primarily to essentially different handling costs incident to the service rendered.

The bulk of the lumber sold in the wholesale market moves directly from the mill to the large consumer and retail dealer. This lumber is not handled by the wholesaler, and his expenses are simply those incident to maintaining a selling organization. When, however, a wholesaler establishes a concentration yard, a warehouse, or a remanufacturing plant as part of his equipment, the additional handling expense on the lumber stored or remanufactured is reflected directly in the price to the consumer.

A relatively small proportion of the total amount of lumber moving monthly or annually passes through wholesale yards or warehouses. This is a special class of business designed to meet a specific but more or less limited demand. An indication of the costs attached to business of this nature is given in the following figures from a company engaged in handling three classes of wholesale lumber trade, i. e., (1) the sale of material shipped direct from the mill to the retail dealer; (2) the carrying of a stock of lumber in a large wholesale yard and its sale in lots as required by customers; and (3) the maintenance of warehouses in which lumber is stored and reconsigned or sold in mixed carloads. The first class constitutes 61 per cent of the business done, the second class 12 per cent, and the third class 27 per cent, based on the footage sold.



FIGS. 3, 3a, 3b.—Wholesale prices, Minneapolis, Minn. Figure 3 shows average monthly prices received (1) by wholesaler (open circles), and (2) by commission men (closed circles). Figures 3a and 3b show wholesalers' average buying and selling prices. (Closed circles=average monthly buying prices; open circles and broken line=through shipments from mill; open circles and solid line=mixed shipments through wholesale yard.)

TABLE 3.—*Wholesale merchandising costs for three departments of business.*

	1 Direct ship-ments.	2 Yard sales.	3 Ware-house sales.
1912.	*Per M feet.*	*Per M feet.*	*Per M feet.*
Gross profit	$0.945	$5.74	$2.36
Operating cost:			
Interest, insurance, and taxes	.049	.443	.202
General office	.596	.298	.298
Bad debts	.054	.025	.027
Buying	.165	.165	.165
Labor and teaming	....	1.27	.357
Total	.864	2.201	1.049
Net profit	.081	3.54	1.31
1913.			
Gross profit	.892	2.62	1.60
Operating cost:			
Interest, insurance, and taxes	.05	.655	.276
General office	.599	.299	.299
Bad debts	.045	.021	.02
Buying	.099	.099	.099
Labor and teaming	....	1.38	.438
Total	.793	2.454	1.132
Net profit	.099	.166	.468
1914.			
Gross profit	1.05	2.37	1.47
Operating cost:			
Interest, insurance, and taxes	.042	.503	.216
General office	.759	.379	.379
Bad debts	.032	.018	.016
Buying	.138	.138	.138
Labor and teaming	....	1.32	.477
Total	.971	2.358	1.226
Net profit	.08	.012	.244
Average for 3 years:			
Gross profit	.95	3.70	1.83
Operating cost	.86	2.33	1.13
Net profit	.09	1.37	.70
Average for 3 years expressed in percentages on sales:			
Gross profit	.034	.136	.066
Operating costs	.031	.086	.04
Net profit	.003	.05	.026

The total amount of material sold during the three-year period was slightly in excess of 212,000,000 feet, or an average of approximately 70,000,000 feet annually. The yard business consisted of two classes of trade, namely: (1) Sales to local retail yards, the material being delivered by team; (2) sales from the yard stock to outlying points, delivery being in most cases in mixed carloads. Although these two classes of business have been grouped in the statement given above, there is even here a marked difference in handling costs, due primarily to the increased delivery charges borne by the material sold to local dealers. A comparative analysis of these two classes of business is given in Table 4.

Shingles and lath have been included in all of these calculations in the ratio of 5,000 lath and 10,000 shingles to 1,000 board feet, respectively. The cost of the wholesale merchandising of lath and shingles is readily obtained in terms of thousands. This is shown in Table 5.

TABLE 4.—*Handling costs per thousand feet.*

Year.	Mixed car sales.	Yard sales (local).
1912	$1.05	$2.60
1913	1.13	3.30
1914	1.23	2.96

TABLE 5.—*Merchandising costs per thousand shingles and lath.*

	1912		1913		1914	
	Shingles.	Lath.	Shingles.	Lath.	Shingles.	Lath.
Direct sales	$0.086	....	$0.079	....	$0.097	....
Yard sales	.22	$0.444	.245	$0.49	.235	$0.47
Warehouse sales	.105	.209	.113	.226	.122	.245

Figures obtained from another company operating a wholesale yard and warehouse and doing a general wholesale business as well, indicated operating costs as a whole ranging from 4.5 to 5.28 per cent, on sales of from $2,000,000 to $3,000,000 annually. During a period of six years 45 to 50 per cent of the business consisted of shipments direct from the mills. The remainder was handled through the warehouse or yard. For the latter class of business, considered separately, operating costs ranged from 6.7 to 7.27 per cent of the sales. Approximately 15 per cent of this business involved team delivery. Merchandising costs in the case of through shipments ranged from 1.9 to 2.4 per cent of the sales, averaging during the last six years 2 per cent on total sales of over $6,000,000.

Expressed in terms of thousand feet and itemized, the costs of wholesaling charged to the transfer yard or warehouse business were as shown in Table 6.

TABLE 6.—*Cost per thousand feet of handling lumber through transfer yard or warehouse.*

	1910	1911	1912	1913	1914	1915
Office:						
General office	$0.22	$0.27	$0.20	$0.20	$0.185	$0.19
Buying	.13	.14	.18	.10	.10	.08
Selling	.27	.27	.24	.29	.265	.31
Yard:						
Insurance	.09	.09	.08	.085	.08	.06
Storage	.20	.19	.21	.175	.17	.17
Yard	.04	.04	.07	.04	.04	.05
Teaming	.14	.15	.15	.16	.14	.18
Labor	1.13	.97	.88	.98	.87	.91
Total	2.22	2.12	1.96	2.03	1.85	1.96

These cases serve to bring out the increased and varying merchandising costs incident to a general wholesale lumber business combined with a concentration or transfer yard. In some cases considerable remanufacturing and regrading are done at these large yards, handling costs being proportionally increased. Figure 4 indicates the margin on which a business of this nature has been conducted during the past 8 years. During some years the annual operations have shown a loss, but for a period of 20 years the company claims to have averaged a net profit of approximately 2½ per cent of the sales.

Special Classes of Trade.

Less direct and concrete factors have a decided effect upon the cost of wholesale merchandising, whether by mill or wholesaler. The policy of the organization itself often influences the cost and gross margin per thousand feet. For example, some concerns sell only to highly rated companies or special classes of trade. This narrows their selling field and usually results in a higher charge per thousand feet to get the business. On the other hand, it is a class of business which as a rule yields wider gross margins.

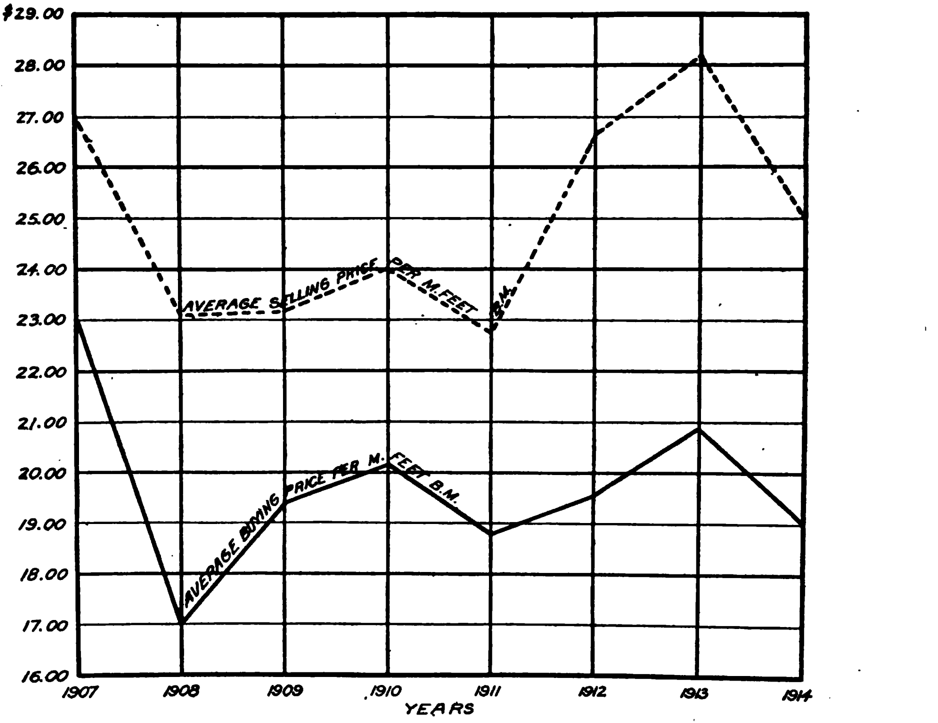


FIG. 4.—Gross operating margin shown by large wholesale and remanufacturing yard. Selling price includes cost of regrading, remanufacture, storage, handling, and profit.

The development of special classes of business in the lumber merchandising field is very characteristic of the wholesale trade. The railroad lumber trade is perhaps the clearest example. Organizations may be found in practically every large city in the Middle West which sell lumber almost exclusively to the railroads. Specialization in the species or kinds of woods handled is also a common practice. Some concerns sell exclusively southern pine, or western woods, or hardwoods; others specialize in one or two species, but also handle small amounts of other kinds of lumber. In the region studied the wholesale merchandising of softwoods and hardwoods is conducted as a rule by separate organizations. This, of course, is not so true of the small broker or commission man as of the larger and well-established wholesale concerns.

While the data obtained on the cost of wholesale lumber merchandising apply especially to softwoods, some figures were secured from companies dealing primarily in hardwoods. They are not sufficient to be conclusive, but indicate that the merchandising of hardwoods is considerably more costly per thousand feet than that of softwoods. This conclusion is in accord with the general understanding of the trade. The principal reason given is the small volume of business available to the hardwood dealer. Softwoods, comprising over 80 per cent of the lumber cut, are sold in much greater volume; consequently the charge per thousand feet is reduced. The following comparison of costs serves to indicate the wide range which appears to exist between the merchandising of hardwoods and softwoods. Ninety per cent of the business of one firm is hardwoods, while the other company handles southern pine only.

TABLE 7.—*Comparison of hardwoods and softwoods with regard to merchandising costs.*

Year.	Firm handling hardwoods.			Firm handling softwoods.		
	Gross profit.	Selling cost.	Net profit.	Gross profit.	Selling cost.	Net profit.
	Per M feet.	*Per M feet.*	*Per M feet.*	*Per M feet.*	*Per M feet.*	*Per M feet.*
1910	$2.16	$1.76	$0.40	$0.89	$0.73	$0.16
1911	2.74	1.63	1.11	.91	.77	.14
1912	2.23	1.62	.61	.89	.70	.19
1913	2.60	1.92	.68	.92	.70	.22
1914	2.23	2.87	[1].64	.89	.72	.17
Av. for 5-year period	2.33	1.94	.39	.90	.72	.18

[1] Loss.

The average annual volume of sales in the case of the company dealing in hardwoods was 21 million feet, as against 163 million in the case of the company handling pine. The average annual operating expenses were $41,000 and $118,000 respectively. In other words, the company dealing in softwoods sold eight times the volume at only three times the total expense. The effect upon operating margins, costs, and net profits per thousand feet is at once apparent.

Many other factors arising in the course of business bear upon wholesale operating costs. For example, the costs of a large selling organization for a period of four years were found to be as follows:

Year.	Cost of selling per M feet.
1911	$0.48
1912	.23
1913	.51
1914	.58

In ascertaining the reason for the exceedingly low cost in 1912, it was found that during that year the company secured a contract for a large amount of lumber, thereby increasing its volume at small expense, with the result that its average selling costs were reduced 50 per cent. The data obtained also indicated a difference in merchandising costs between concerns selling primarily to yard trade and those selling to consumers who buy in large quantities, often by contract. The explanation is apparently one of volume, more salesmen and heavier expenses being required to obtain an equivalent volume in the yard trade.

COMMISSIONS.

No standard rate of commissions is paid by mills for the sale of their lumber. Consequently commissions vary as between mills, species, and grades. In many cases the mills pay a commission on the car unit, a common rate on southern pine being $5 per car, although it may extend to $10 or more, depending upon the grade. Other mills grant commissions on the basis of the thousand-foot unit. These rates ordinarily are from 30 to 50 cents per thousand feet, but in cases of special stock or business reach as high as $1 and $1.50 per thousand. The common practice with small mills in the South is to base commissions on either a car or thousand-foot unit. It is also the prevailing basis used by large mills which sell through commission men. A commission firm in one of the large cities of the Middle West, handling from 50 to 80 million feet annually, charges the small mills for which they sell 30 cents per thousand feet on common grades of yellow pine and 40 cents per thousand feet on the higher grades.

Figures obtained from the books of a large mill selling approximately $90,000 worth of its products through commission men showed that its commissions averaged 2½ per cent of the mill value of the lumber. This was equivalent to approximately 32 cents per thousand feet. In this case the most common rate was $5 per car, although considerable material was sold on commissions of 35 cents per thousand for common and 50 cents per thousand for upper grades.

Another basis used in fixing commissions is a certain percentage of the f. o. b. mill price. This is a common practice with western mills, the usual rate being 5 per cent. On 26 million feet of Douglas fir sold by a commission firm in the Central States the average commission received per thousand feet amounted to 35 cents.

The data as a whole indicate that the commissions paid for selling softwood lumber in the Central States average from 30 to 40 cents per thousand feet. It should be held in mind, however, that these figures do not represent the total selling cost of the mill and are not directly comparable with the costs shown for sales by wholesalers and by the mill itself. This is because the commission man as a rule simply sells the product, leaving the handling of the account to the mill. Therefore the final cost to the mill is the commission paid plus the cost of handling and collecting accounts and costs incident to the settlement of claims.

Of the various methods employed in establishing commissions, that providing a certain per cent of the mill price seems most satisfactory from the standpoint of price stability. Where the commission is based upon the car or thousand-foot unit the commission man's profit is increased directly by the volume of material sold, regardless of the price which he obtains. To increase the volume sold, the commission man often bears down upon the mill to reduce its price in order to meet competition. This is especially true during periods of slack trade and intensified competition. This method of fixing commissions tends to encourage price reduction, especially during periods of keen competition and through the activities of irresponsible commission men.

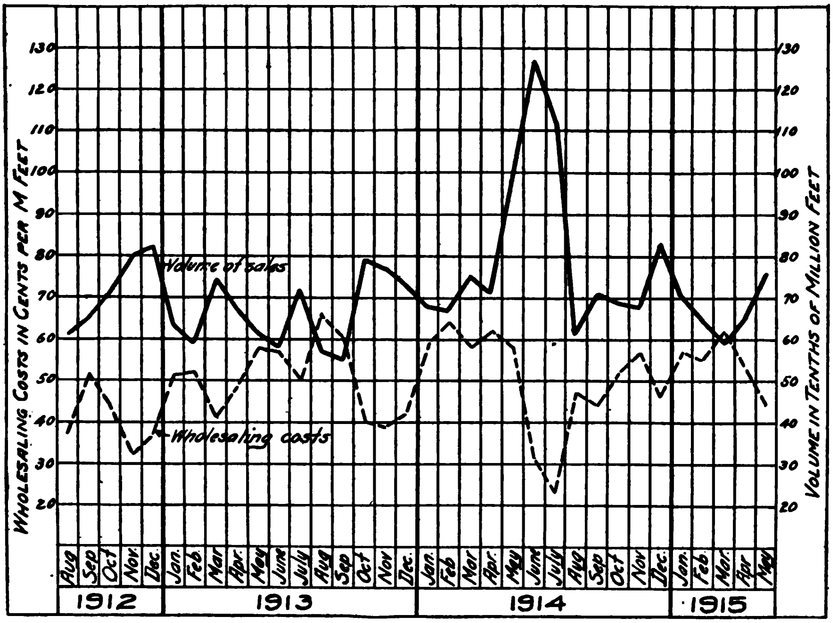


FIG. 5.—The effect of volume on monthly costs of wholesaling lumber per thousand feet based on records of one company.

When commissions are based on a percentage of the mill price it becomes more advantageous for commission men to work for good prices, since thereby their own profits are increased.

VOLUME AS AFFECTING COSTS.

Volume of business is a basic factor which directly influences costs and profits expressed in terms of lumber quantities. If each selling organization could operate to full capacity monthly and yearly, the wholesale merchandizing charge borne by lumber would be materially reduced; but this, of course, is out of the question under the variable demand for lumber and the highly competitive and unregulated form of the business. The direct effect played by volume in relation to merchandising costs is shown graphically in figure 5. The adjustment of expenditures to meet fluctuations in the volume of business transacted has been one of the difficult problems in the wholesale trade during the past 10 years.

Competition is essentially a struggle for volume of business and must, therefore, be taken into consideration when discussing factors of cost. The number of wholesalers seeking lumber sales at various central points has increased during the past 15 years out of all proportion to the increase in business. According to the records of a lumbermen's credit association there were, in 1900, 896 wholesale lumber dealers in 155 of the largest cities in the United States. This included not only strict wholesalers, but brokers, jobbers, commission men, and mills which were handling their product from wholesaling offices. In 1910 these same market points showed a total of 3,032 dealers, an increase during 10 years of 238 per cent. During the same period the increase in the lumber cut for the nation was from 35,084,166,000 to 44,509,761,000, or 26.9 per cent.

The result reflected by these figures, which are approximately accurate, is the marked decrease in the average volume of business available per dealer. A shrinkage of from 50 to 60 per cent in the average volume of lumber sold per dealer appears to have taken place during the decade ending 1910. Since 1910 the annual lumber cut has fallen off slightly and there has doubtless been a small decrease in the number of wholesale dealers, due to the depression in the trade.

This great increase in the number of wholesalers has been a natural outgrowth of conditions surrounding the lumber industry prior to 1907. As the mills became more and more distant from the market centers, the need for middlemen developed rapidly. The increase in the number of species entering into competition strengthened their position through forcing the manufacturer to utilize their services in order to market the entire output of his mill. The field was a large one; manufacturers were individualistic, competitive, widely scattered, and disorganized, while attractive profits were attributed to every branch of the lumber business. No apprenticeship was required; no examination or test of technical or expert knowledge was imposed; capital was not always essential; in short it was an unrestricted and open field. This appears to be true to-day as a general characterization of wholesale lumber distribution. The new dealer may engage in sharp practices and the industry has not the means to disbar or expose him. The consumer necessarily suffers from his methods or from his lack of knowledge. He may cut prices below cost, or enter the field only during periods of heavy demand simply as a side issue to his regular business. The established wholesaler, carrying the responsibilities and obligations of a permanent and sound business, must meet his competition. It is therefore not surprising that the field is overcrowded, that competitive conditions within the trade are chaotic during periods of depression, and that lumber merchandising has not kept pace with merchandising in other lines.

The cost of wholesaling is a direct charge upon distribution which operates to decrease the f. o. b. mill price of lumber and to increase its final price to the consumer. Any marked increase in the number of dealers employed in selling without a corresponding increase in the amount to be marketed results in a heavier charge per thousand feet and a closer margin of profit for those engaged in the business. Many wholesalers are free to admit that their business to-day must be transacted on a much smaller margin of profit than in former years, while the actual cost of selling a thousand feet of lumber has increased on account of the smaller average volume of business. This is due in part to the increasing number of wholesalers, jobbers, and commission men whose service charge is levied upon the lumber sold. A further result is the enforced assumption of a like charge by the manufacturer who does not engage the services of wholesalers, because under the intense competition thus created he must expend an equivalent amount in order to market his output successfully, whether it be done by mill salesmen, by expensive advertising, or by other means. This is essentially a question of the economics of competition. Whether mills financially able to market their own product in a wholesale way can do so more economically than independent distributors remains to be seen. Judged from present merchandising tendencies it would seem that this competition will not be decided so much by a small difference in cost as by the service rendered to consumers.

It should be borne in mind that one step toward the more efficient merchandising of lumber is the application of more technical and expert knowledge regarding the qualities of lumber and its economic uses. This will be increasingly true in the future. With many kinds of material to choose from, consumers will demand exact information on their relative qualities. The competition of substitutes has already brought this situation before the lumber industry, and it is making individual and cooperative efforts to meet it. In the modern merchandising field consumers are being given more information about the articles they buy then ever before, because to do so is a competitive necessity.

RAIL TRANSPORTATION OF LUMBER AND ITS COST.

Railroad transportation is a major factor in the price the consumer pays for lumber. The country's annual freight on lumber is close to $170,000,000, with a tonnage exceeding all other classes of freight except general manufactures and the products of mines.

The lumber rate fabric is a patchwork built up largely upon the principle of what the traffic will bear. The many thousand freight tariffs represent in most instances general commodity rates with practically no scientific classification based on the different kinds or values of lumber. Although there may be a difference of $40 or $50 per thousand feet in value, high-grade lumber usually takes the same rates as low-grade stock. This tends to waste low-grade material, but on the other hand facilitates refined manufacture at the source and promotes economy in distribution by mixed carloads.

Wholesale lumber prices are determined in large part by freight rates to the points of delivery, which are based entirely on weight. The freight borne by softwood lumber marketed in the Middle West lies between 25 and 30 per cent of the delivered wholesale price and between 20 and 25 per cent of the average retail price.

The rail transportation of lumber from the mill where it is manufactured to the local distributing point where it is consumed or remanufactured is one of the principal items in lumber distribution. This cost is one of the major factors determining the price of lumber to the consumer. Of the lumber consumed annually in the Central States, 95 per cent or more is transported wholly by the railroads. The remainder is either manufactured and consumed locally or reaches consuming centers by water or by a combination of water and rail shipments.

Obviously transportation exclusively by water is restricted to cities and towns along the Great Lakes and navigable rivers which have direct water communication with sawmills. The interior river trade is practically negligible, while water shipments to distributing points along the Great Lakes have steadily decreased as the timber tributary to the lakes has been cut out and railroad transportation has developed. The lumber shipped by lake to Chicago in 1914, for example, amounted to only 7 per cent of the total deliveries. During the same period there were no water shipments from Chicago. During the five years previous such shipments averaged 1,650,000 feet annually, or only about one-tenth of 1 per cent of the total shipments from Chicago in 1914. (See fig. 6.)

When the great consuming territory of Indiana, Illinois, Wisconsin, Missouri, Oklahoma, Kansas, Iowa, Nebraska, Minnesota, and the Dakotas is taken into consideration it will be apparent that water transportation is an insignificant factor in lumber distribution in the Middle West as a whole. This report, therefore, deals only with rail transportation as a distributing cost.

LUMBER TRAFFIC AND FREIGHT RATES.

The importance of transportation as an element in the cost of lumber makes it worth while to outline the existing situation as regards lumber traffic on the railroads and the making of lumber tariffs.

The statistics of the Interstate Commerce Commission for the year ending June 30, 1914, indicate that lumber and other forest products furnished 10.23 per cent of the tonnage carried by the railroads of the United States, or about 199,000,000 tons. Their total was slightly greater than that of agricultural products and exceeded all other classes of railroad freight except general manufactures and the products of mines. From the receipts for transporting lumber reported by about 61 per cent of the railroad mileage in the country, it seems probable that the total annual lumber freight bill is approximately $170,000,000. This is not far from 30 per cent of the amount received by the sawmills for their product. It is of interest to note in this connection that the average receipts of the railroads for hauling lumber were 0.698 cent per ton-mile as compared with 0.457 cent for bituminous coal, 0.602 cent for anthracite coal, 0.639 cent for grain, 0.972 cent for dressed meats, and 1.77 cents for cotton.

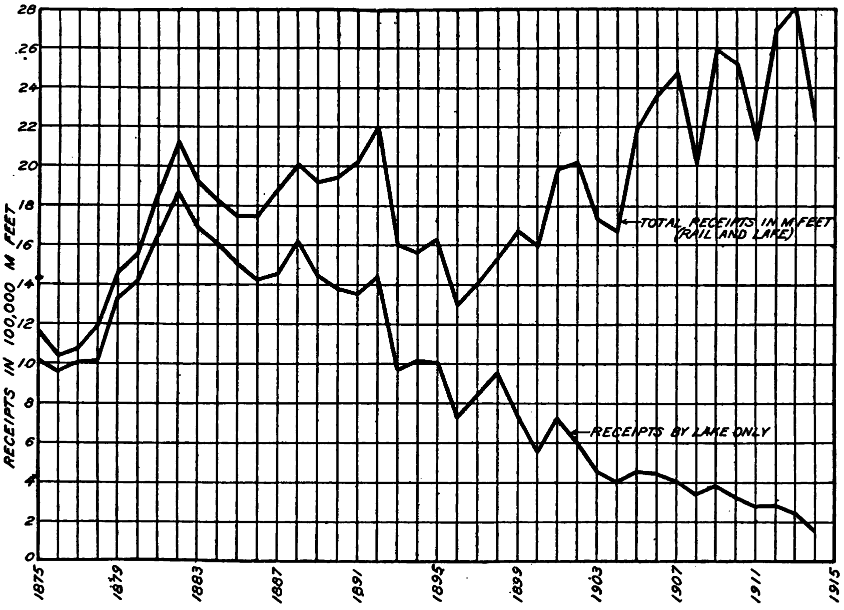


FIG. 6.—Amount of lumber received annually at Chicago by rail and lake and by water only since 1875. Data from Chicago Chamber of Commerce.

There has been little uniformity or attempt at a scientific basis in the making of lumber freight rates. They have resulted largely from guesswork, expediency, local or industrial pressure, or the competitive conditions governing the operation of particular railroads or particular groups of sawmills. The mills of one region have sought markets in competition with other producing regions, and the railroads entering each new field have sought the business of transporting its products under whatever competitive conditions geographical location or available markets might determine. Hence a complexity of rates, classifications, rules, orders, and exceptions has grown up.

The whole lumber rate fabric is interwoven with incongruities and inconsistencies; yet it is so fundamental to the industries which have grown up upon and around it that even slight changes may seriously upset the existing industrial structure.

The most common method of making rates based upon considerations of a business character without recognition of any scientific principles of rate making is seen in the fixing of transportation charges to Chicago. The market prices for lumber to Chicago 50 years ago were set by sawmill operators on the east shore of Lake Michigan, who shipped their product almost exclusively by water. Much of the lumber from these mills sent to Chicago by vessel was reshipped to communities in the Middle West. When the manufacture of lumber was begun in Wisconsin, the freight rate put into effect for shipments which could not be moved by vessel was supposed to represent the difference between the cost of manufacture with a reasonable profit and the price at which stock from Michigan was being sold on the Chicago market. This perhaps instances the beginning of competitive rate making as far as lumber is concerned. The same principle governed the making of rates on lumber from the southern mills, in the grades and sizes competing with northern lumber, when the central market was entered by the yellow-pine producers. Again, when lumbermen began active operations in Oregon and Washington, a similar process of rate making was employed to enable these still more remote mills to reach the common market. In the latter instance, however, the cost of handling the traffic became a more important factor in the tariffs, with the result that shipment of only the more valuable grades as far east as Chicago was made possible.

Freight rates were rapidly complicated by the increasing diversity of manufactured products. To the early shipments of logs, timbers, and lumber in a few simple forms, for example, were added highly finished lumber, boxes, made-up doors, glazed window sash, partially finished or turned vehicle stock, and the like. These products differed widely in market value, in the weight which could be transported per car, in susceptibility to damage during transit, etc. The outgrowth of this diversity was the cooperation of railroads in classifying freight. By classifying the innumerable articles of commerce in accordance with their high or low value, heavy or light weight, bulk or compactness, and their character as perishable or imperishable, fragile or unbreakable, etc., the roads in a given territory have sought to establish a more uniform basis for rate making. Specific tariffs were still left to be fixed by each road, and any road could make an exception from the classification to favor traffic from a particular region.

Freight classifications for many years were without State or Federal regulation. In interstate traffic they must now be filed with and approved by the Interstate Commerce Commission. For the purposes of classification the United States is divided into three general areas known as the official, southern, and western classification territories. A number of minor classification groups exist, chiefly for shipments within a single State. The classification of articles for rate making purposes is by no means uniform within the several territories. In general, however, four principles govern classification—the value of the article or commodity, its bulk, its weight, and its susceptibility to damage. Lumber falls into a comparatively low classification, since (1) its value is comparatively low and can not be burdened with a heavy transportation charge and successfully compete with other materials; (2) it is not so bulky or unwieldy but that it can be readily stowed and safely carried on ordinary equipment; (3) its weight is sufficient to exceed the minimum loading capacity of the average car and its compactness permits maximum car loading, and (4) it is not easily pilfered and can not readily be damaged, so that claims are relatively small.

While classifications have been regulated to some extent by legislation, no general uniformity in regard to forest products is practiced in the three territories. The classifications themselves are drawn up by committees representing the railroads operating within the particular territory. These bodies regularly consider the appeals of shippers for changes in the classifications affecting their products. The resulting modifications are usually based on a compromise, with the theory of scientific classification often thrown to the winds by the necessity of a pressing situation. While the trend has been to simplify classification, attempts at uniform descriptions have not been successful because of the magnitude of the task and the countless inconsistencies which exist.

The classification basis of freight making has not been widely applied by carriers to forest products. Railroads have frequently made exceptions or rules, either individually or as members of district freight associations, which may change entirely the application of the classification. With lumber, as with such articles as brick, cement, oil, grain, coal, and live stock, this has been done largely by establishing commodity rates, based upon carload shipments. Commodity tariffs, which for practical purposes put the article in a class by itself, are invariably lower than rates fixed by classification and in general apply to articles which move in great volume from one section of the country to another.

Commodity rates are often based largely upon competitive conditions; that is, upon the principle of "charging what the traffic will bear." The relative value of lumber as compared with other classes of traffic is seldom taken into account. Competitive conditions between groups of sawmills in different sections served by the same railroad, or between a group on one railroad and that on another, or between the great lumber-producing regions of the South, North, and West, or indeed, between lumber and other materials competing for the same uses, are apt to be the controlling factors. It is often felt desirable for carriers to extend the market radius of new commercial woods and to aid in their exploitation by favorable rates.

Commodity rates may, however, recognize classification principles to a greater or lesser degree. In establishing tariffs applicable to lumber, consideration has undoubtedly been given to the fact that no special equipment is required for its transportation. The cars used to move other kinds of freight in one direction can often be employed for hauling lumber on the return, doing away with the expense of hauling empty rolling stock. Lumber of some kind may be safely loaded and carried to market in every type of car—flat, box, stock, or gondola. It is necessary, of course, to load finish lumber in a box car where it will be protected from the weather; but rough lumber can be exposed without serious damage. Forest products, furthermore, are not perishable, like field or orchard crops, and their movement need not be rushed; the railroads, in fact, look upon lumber as sure traffic when they are ready for it, and lumber often suffers in prompt distribution at seasons of the year when perishable crops are transported.

There is, furthermore, a rough classification of timber products under the commodity rate. Three classes are usually recognized: (1) Rough products, such as logs, bolts, or flitches; (2) lumber or other partially finished articles, not yet worked into a final manufactured product, and (3) finished articles like boxes, barrels, doors, or blinds. In practically all regions the tariffs also apply a higher rate to so-called "woods of value"—walnut, cherry, holly, mahogany, etc. Higher rates are sometimes put on hardwoods than on soft woods because of their greater commercial value and in the West a higher rate is applied to cedar lumber because of its light weight.

As a general rule the rates on rough and dressed lumber are the same, and these rates have been adjusted so as to apply to practically all planing-mill products. West of the Missouri River the rate on rough or finished lumber is applicable also to box shooks, doors, and sash, both in straight and in mixed carloads. Wood partly finished for agricultural implements, sleighs, or vehicles, on the other hand, takes a slightly higher rate, while finished hubs, spokes, or handles pay a still higher charge. Uniformity, however, is lacking. The State railroad commissioners of Wisconsin and Minnesota enforce a lower rate on fence posts and sawmill scraps than on rough lumber; and elsewhere lower rates on mine ties and timbers are common.

Individual carriers have in several instances applied higher rates to the more valuable grades of lumber on the ground that costly products, like dressed flooring, are more susceptible to damage than such material as rough scantlings. In general, however, departures from the long-established rule of applying one tariff to all of the customary products of lumber-manufacturing plants, whether shipped in straight or mixed carloads, have not been permanent. The principal objection to them on the part of the railroads is that grade specifications are too freely drawn to make it practicable to distinguish between them in freight tariffs, and that the application of differentials in favor of low grades would entail an excessive cost for inspection. The somewhat anomalous condition prevails everywhere, therefore, that the most valuable product of a mill, say a grade of flooring bringing a wholesale price in the Middle West of $50 per thousand feet, pays the same freight rate as the lowest grade of common boards wholesaling in the same region at perhaps $15 per thousand, and in fact costs less to ship because it is dressed and seasoned to a lower weight per thousand feet.

Many significant features of the lumber industry grow out of this practice of levying a uniform freight rate upon all grades of lumber and planing-mill products. At the tariffs now prevailing, the utilization of timber of poor quality in the form either of inferior species or knotty, low-grade logs in localities at considerable distances from markets for such material is seriously handicapped. The large waste in lumber production in the Northwest, often amounting to 30 per cent of the material in the forest, is partly attributable to this condition. One phase of it is that, with a charge added to low-grade lumber by its transportation to market equal to or greater than that imposed upon high-quality products, the mill value of the former is depressed disproportionately in comparison with its intrinsic value and its going price at the point of delivery.

The economy of surfacing, finishing, and remanufacture in planing mills, box factories, etc., is related directly to the uniformity in freight tariffs on all mill products. Surfacing a thousand feet of lumber may reduce its weight as much as 700 pounds, at a cost of perhaps 60 cents. If no higher rate is paid on surfaced lumber, this obviously will be done at the shipping point to gain the advantage of reduced weight, except in the case of short hauls, where the cost of surfacing would not be repaid by the reduction in the freight charge. Similarly the present method of fixing tariffs encourages the remanufacture of lumber at the shipping point into boxes, doors, sash, and other products ready for final use, since the same rate is still obtained and a great saving in weight effected. In the class of boards, for example, from which clear cuttings are made for building doors, there is usually a waste of 30 per cent, consisting of knots and other material not usable for this purpose. Freight on this waste is saved by manufacturing doors at the sawmill.

From the standpoint of the public, as final a degree of manufacture as practicable "at the source" appears advantageous, since it tends to reduce the retail price of timber products by eliminating freight on waste material. It also promotes close use at the sawmill of certain inferior grades of lumber, from which small clear cuttings can be made for working into doors and other planing-mill products. This might not be accomplished as cheaply or effectively were the remanufacturing processes moved to a considerable distance.

The application of the same rate to all grades of rough and finished mill products also underlies the shipment of "mixed" carloads. A single car from the West Coast, for example, may thus contain rough dimension lumber, high-grade finishing stock, doors, and sash, a complete assortment to supply a small retail yard or construct a building. The advantage which can thus be taken of the much lower rates applicable to carload lots promotes economy in the distribution of lumber and aids direct shipments from the mill to retailer or consumer.

While the classification of commodities is under the direction of the three general classification committees, lumber rates are actually fixed by the carriers individually or jointly through the agency of one of the freight tariff bureaus. The commodity rates on lumber range from a few cents to about 75 cents per 100 pounds, according to the distance hauled. Illustrative rates from several producing regions to large consuming points are given in the Appendix and on the map (fig.7) facing page 49. Their range, diversity, and complexity are enormous. "Local" rates are quoted on shipments from one point to another on the same railroad; "joint" or "through" rates on traffic over two or more railroads; "combination" rates on traffic covering two or more local rates; and "basing" rates on shipments to a terminus like New York, where a local rate to the point of destination is added. "Manufacturing in transit" rates are also in effect on some of the railroads, which permit the shipment of lumber or logs to a specified point where the material goes through some manufacturing or refining process before being sent on to destination. An additional charge is generally made to cover the expense of service to the railroad. Reconsignment privileges are also allowed, where shipments are made to some point with the right of the shipper to divert the car or cars before the original destination is reached. Reconsigning of lumber has largely built up the transit-car business. Another transit privilege is the stop-over arrangement by which loaded cars may be held in storage from a few days to one year, the time limit varying with different carriers.

VOLUME MOVEMENT OF SOFTWOOD LUMBER.

The bulk of the softwood lumber consumed in the Middle West comes mainly from four producing regions: (1) Southern yellow pine, from Alabama, Georgia, Mississippi, Louisiana, Texas, Arkansas, Oklahoma, and Missouri; (2) hemlock and northern pine, from

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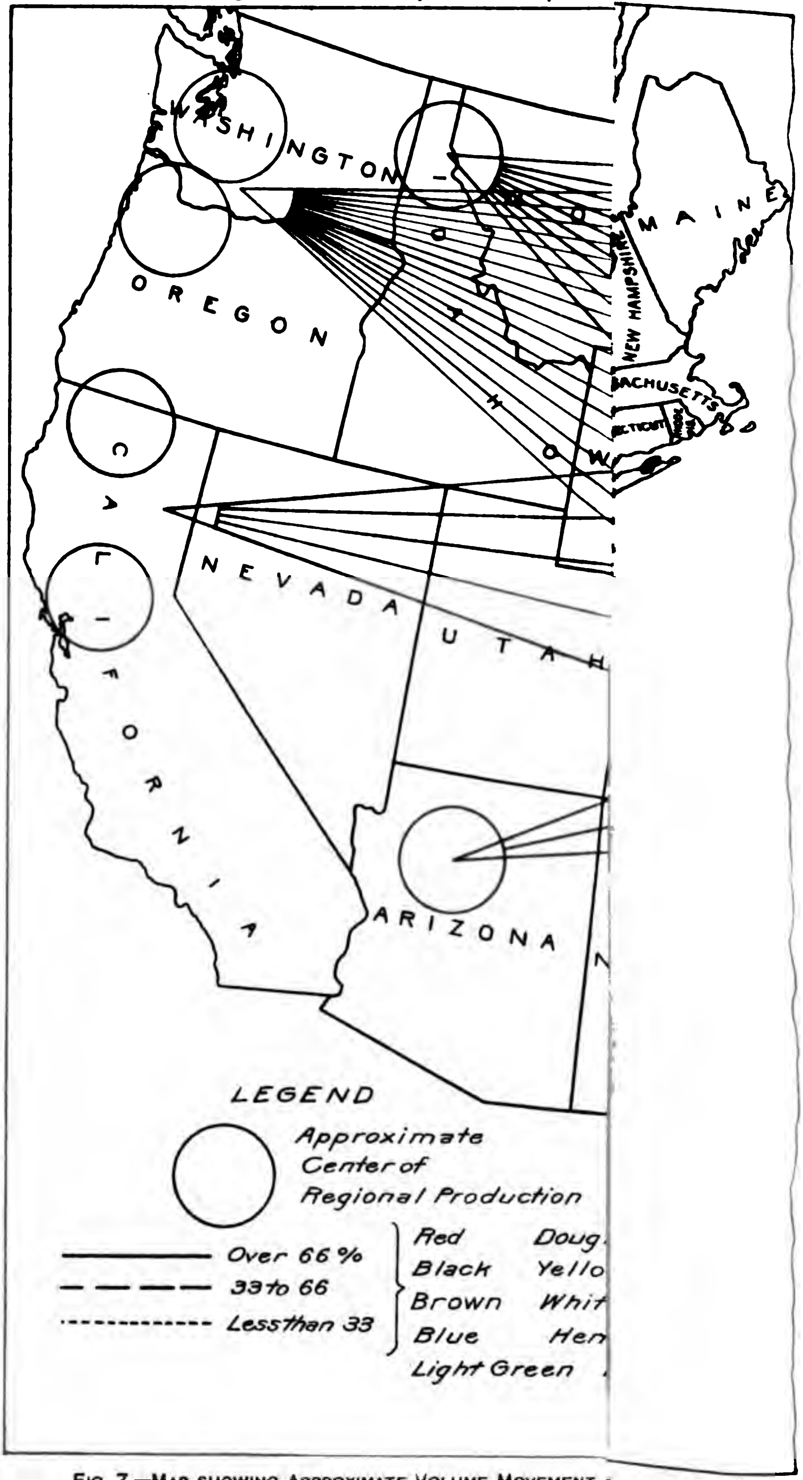

FIG. 7.—MAP SHOWING APPROXIMATE VOLUME MOVEMENT NEBRASKA,
ILLINOIS, INDIANA, WISCONSIN, MINNESOTA, NORTH E BASED ON
ESTIMATED TOTAL CONSUMPTION OF RETAIL TRADE I

orthern Michigan, Wisconsin, and Minnesota; (3) Douglas fir, from western Oregon and Washington; and (4) western pine, from eastern Oregon, Idaho, and western Montana.

The general location of these producing centers in relation to the Central States and the movement of the different species of lumber into this territory are shown graphically in figure 7 and specifically in Table 8, given below. The map is based upon reports from 869 retail yards throughout the region, and applies only to lumber consumed in the retail trade. It therefore represents in a broad way the relative volume of retail lumber consumption of the various species, and at the same time graphically indicates the competition of different woods. In this map the radiating lines have no application outside the States of Indiana, Illinois, Wisconsin, Minnesota, the Dakotas, Iowa, Nebraska, Missouri, Kansas, and Oklahoma.

The country-wide distribution of the more important species of softwood lumber is indicated in Table 22 in the Appendix.

TABLE 8.—*Estimate, by States and species, of lumber sold through retail yards in the Middle West.*

[Based on reports from dealers throughout the States, giving relative percentage of different species handled.]

Species.	Per cent.	M feet.
INDIANA AND ILLINOIS.[1]		
1. Southern yellow pine	73.0	1,637,856
2. Cypress	10.4	233,338
3. Poplar	4.0	89,746
4. Oak	3.1	69,553
5. Red cedar	2.8	62,822
6. Redwood	1.0	22,436
7. Gum	.9	20,193
8. White pine[2]	.8	17,949
9. Maple	.8	17,949
10. Beech	.8	17,949
All others	2.4	53,847
Total	100.0	2,243,638
OKLAHOMA.		
1. Southern yellow pine	95.0	333,246
2. Red cedar	2.3	8,069
3. Oak	1.0	3,508
4. Cypress	1.0	3,508
5. Redwood	.4	1,403
6. White pine[2]	.2	701
7. Poplar	.1	350
Total	100.0	350,785
IOWA.		
1. Southern yellow pine	42.0	443,827
2. Douglas fir	18.0	190,212
3. White pine[2]	16.0	169,077
4. Cypress	7.0	73,971
5. Red cedar	4.0	42,269
6. Western yellow pine	3.0	31,702
7. Hemlock	3.0	31,702
8. Spruce	1.3	13,738
9. Oak	1.3	13,738
10. Redwood	1.0	10,567
All others	3.4	35,929
Total	100.0	1,056,732
SOUTH DAKOTA.		
1. Douglas fir	38.8	81,505
2. White pine[2]	38.4	80,665
3. Western yellow pine	8.0	16,805
4. Red cedar	4.0	8,403
5. Hemlock	3.7	7,772
6. Southern yellow pine	3.0	6,302
7. Maple	1.0	2,101
8. Oak	.6	1,260
9. Beech	.5	1,050
All others	2.0	4,201
Total	100.0	210,064
WISCONSIN.		
1. Hemlock	50.0	313,944
2. White pine[2]	16.2	101,717
3. Southern yellow pine	9.0	56,510
4. Douglas fir	7.0	43,952
5. Maple	2.7	16,953
6. Red cedar	2.5	15,697
7. Oak	1.3	8,163
8. Tamarack	1.3	8,163
9. Cypress	1.0	6,279
10. Basswood	1.0	6,279
All others	8.0	50,231
Total	100.0	627,888
KANSAS.		
1. Southern yellow pine	69.0	246,961
2. Douglas fir	10.0	35,792
3. Cypress	6.4	22,907
4. Red cedar	4.4	15,748
5. White pine[2]	4.3	15,391
6. Oak	3.5	12,527
7. Redwood	.7	2,505
8. Spruce	.7	2,505
9. Western yellow pine	.3	1,074
All others	.7	2,505
Total	100.0	357,915

[1] Based on figures from Indiana.

[2] White pine includes Norway pine, Idaho white pine, and northern white pine.

TABLE 8.—*Estimate, by States and species, of lumber sold through retail yards in the Middle West*—Continued.

Species.	Per cent.	M feet.
MINNESOTA.		
1. White pine[1]	46.5	347,339
2. Douglas fir	33.0	246,499
3. Hemlock	6.9	51,541
4. Red cedar	3.4	25,397
5. Southern yellow pine	3.4	25,397
6. Spruce	1.2	8,963
7. Maple	.9	6,723
8. Tamarack	.8	5,976
9. Western yellow pine	.7	5,229
10. Beech	.5	3,735
All others	2.7	20,168
Total	100.0	746,967
MISSOURI.		
1. Southern yellow pine	75.0	522,858
2. Red cedar	8.5	59,257
3. Cypress	8.0	55,772
4. Oak	3.5	24,400
5. Douglas fir	3.0	20,915
6. White pine[1]	1.0	6,971
All others	1.0	6,971
Total	100.0	697,144
NEBRASKA.[2]		
1. Southern yellow pine	33.0	187,773
2. White pine[1]	22.0	125,183
3. Douglas fir	20.0	113,801
4. Red cedar	7.0	39,831
5. Cypress	6.0	34,141
6. Oak	4.0	22,760
7. Western yellow pine	4.0	22,760
NEBRASKA—Continued.		
8. Hemlock	1.0	5,690
9. Spruce	1.0	5,690
All others	2.0	11,380
Total	100.0	569,009
NORTH DAKOTA.		
1. Douglas fir	61.0	126,641
2. White pine[1]	17.6	36,539
3. Hemlock	9.0	18,685
4. Red cedar	4.5	9,342
5. Maple	2.2	4,567
6. Southern yellow pine	1.8	3,737
7. Western yellow pine	1.6	3,322
8. Oak	.9	1,869
9. Basswood	.9	1,869
10. Larch	.2	415
All others	.3	623
Total	100.0	207,609
TOTAL.		
1. Southern yellow pine	49.0	3,464,467
2. White pine[1]	12.8	901,532
3. Douglas fir	12.1	859,317
4. Cypress	6.1	429,916
5. Hemlock	6.1	429,334
6. Red cedar	4.1	286,834
7. Oak	2.2	157,778
8. Poplar	1.3	90,096
9. Western yellow pine	1.1	80,892
10. Maple	.7	48,293
All others	4.5	319,292
Total	100.0	7,067,751

[1] White pine includes Norway pine, Idaho white pine, and northern white pine.
[2] Basis insufficient.

NOTE.—The above estimates of the amounts of various kinds of wood consumed through the retail trade were compiled by applying to the total retail consumption in each State the average percentage of different species sold, as reported by the dealers throughout the several States. This information was not obtained from dealers in Illinois, and the figures given for that State are based upon the relative percentages reported from Indiana. This estimate is thought to be close, with the exception that hemlock is probably one of the first 10 species in Illinois.

It should be borne in mind that the consumption of different species in many localities is often subject to radical changes within a comparatively short time. By reference to the map it will be noted that the species consumed in the greatest volume in this territory are southern pine and Douglas fir, the former being predominant in the southern portion of the region, while the latter holds the markets of the prairie States. The region in which these two species come into greatest competition is in Nebraska, Iowa, and western Kansas. This is due largely to the fact that freight rates on the two woods are more nearly equalized in those States. Marked changes in the price of either species have a direct effect upon the volume consumed locally; and the species which can be obtained at the lower price ordinarily dominates the market.

The two principal factors in determining the volume movement of lumber from the different producing regions are (1) transportation costs and (2) the fluctuating competitive struggle of the regions with each other for the market. These two factors are closely related, and both are subject within certain limits to the forces of supply and demand. This is particularly true of the common grades which form the bulk of the lumber consumed and therefore dominate the retail markets. Geographically, the competition of species, as is readily apparent from the map, can be measured broadly by the relative volume of lumber production. Southern pine and Douglas fir are produced in the greatest quantities and radiate farthest from their centers of production in search of markets, despite the fact that they are not as favorably situated in regard to freight rates as northern pine and hemlock. The combined production of the latter is only 12½ per cent of the aggregate production of southern pine and Douglas fir.

As the total production of southern pine increases, for example, or as the mills become overstocked, the territory into which southern pine lumber moves in predominating volume widens. In order to move the lumber at the mills lower prices are made in competition with the species which hold the more distant markets. As mill stocks approach normal, this movement gradually contracts geographically to the territory in which southern pine mills are able to market their lumber under more favorable freight rates and less keen competition with other species.

In the higher grades of lumber, and to a lesser extent in the common grades, a third factor exerts a considerable influence, namely, the adaptability of certain species and grades to special uses and the demand for them by the consumer regardless of differences in price. In such cases the effect of transportation cost on distribution is not so marked.

It will be clear, therefore, that while transportation exerts a very great influence on the volume movement of the different species geographically, it does not establish fixed lines. This movement is subject within certain ranges to the changes and shifts wrought by competitive forces.

THE COST OF RAIL TRANSPORTATION.

VARIABILITY OF TRANSPORTATION COSTS.

The transportation cost in lumber distribution is subject to wide variations. It is never fixed or uniform. It is therefore impossible to arrive at an exact average cost of transportation for any species or consuming territory. Transportation charges vary directly with the freight rate in effect from the mill to the consuming point, with the weight of the lumber, and with the manner in which it is shipped. The rates on less than carloads are much higher. Consequently, the amount of lumber so shipped is relatively small and restricted in so far as possible to emergency and special needs.

Minimum weights are specified by the railroads to which cars must be loaded in order to take the rates applying to carload lots. This minimum weight depends upon the prescribed capacity of the car in which the lumber is shipped. The actual amount loaded depends upon the size of the car, the kind of material, and the car capacity. As long as the load equals the minimum weight prescribed or the car is loaded to visible capacity, the rate per 100 pounds remains the same whether the car contains 15,000 or 25,000 feet. The average contents of cars shipped from the South as noted from shipments examined in the course of this study ranged around 18,000 feet, while shipments from the West contained from 25,000 to 30,000 feet per car.

From the many thousand lumber tariffs between producing regions and the Central States, a few representative points have been selected to show, without a confusing mass of figures, the relative transportation costs incurred by different species. For this purpose Chicago, Kansas City, Minneapolis, and Alliance, Nebr., have been selected. Figure 7*a* shows graphically the location of these points in relation to the producing regions, the freight rates applying to them, and the approximate hauling distance in miles. The map brings out very clearly the comparative advantages and disadvantages under which the different manufacturing regions are placed, from a transportation standpoint, in meeting competition upon a common price plane. This situation is illustrated further by figure 7*b*, which is based upon the established shipping weights of the different species. From this figure it will be noted that the rates on the different species are more nearly equal in Nebraska, where the distribution map reflects the most intensive competition, than in other States.

In expressing the cost of transportation per thousand feet of lumber, another set of variables—the weight of the lumber—is introduced. In view of the fact that freight is based upon weight and not footage contents, it is obvious that any variation in weight directly affects the transportation cost per thousand feet of lumber. There is a wide variation in the weight of lumber per thousand feet, not only as between different species, grades, and sizes, but in lumber of the same species, grade, and size. This is due primarily to seasoning and dressing and to the quality of the timber in different sections of the same producing region.

Green lumber weighs much more than that thoroughly seasoned, so that lumber shipped green from the saw incurs heavier transportation costs than that which is held at the mill until properly dried. Lack of capital and facilities for seasoning, particularly in the case of small mills, and the necessity of shipping green or partially seasoned stock to meet orders are responsible for the imposition of heavier freight charges than necessary on a great deal of lumber. The dif-

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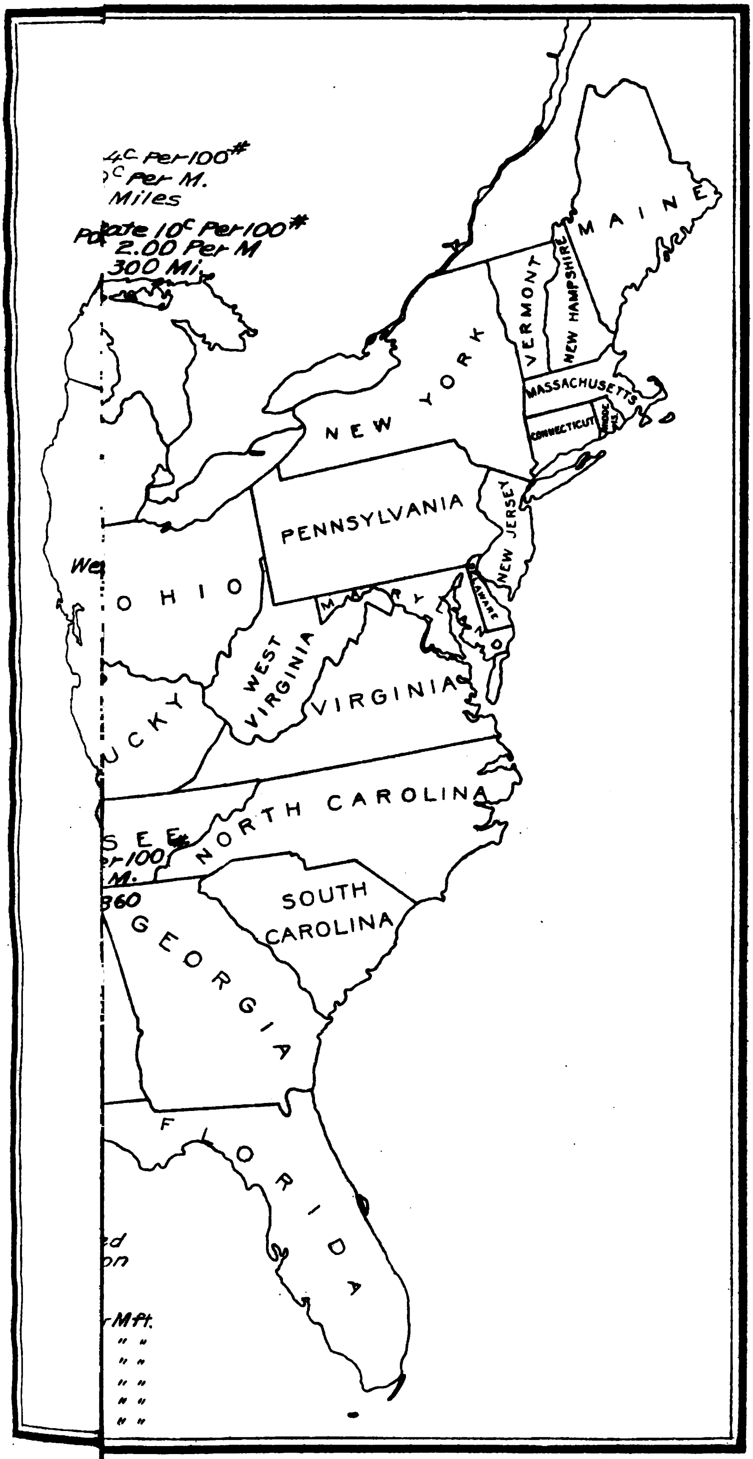

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ference in freight between dry stock and partially dry or green stock would not, however, represent a net saving in cost to the consumer

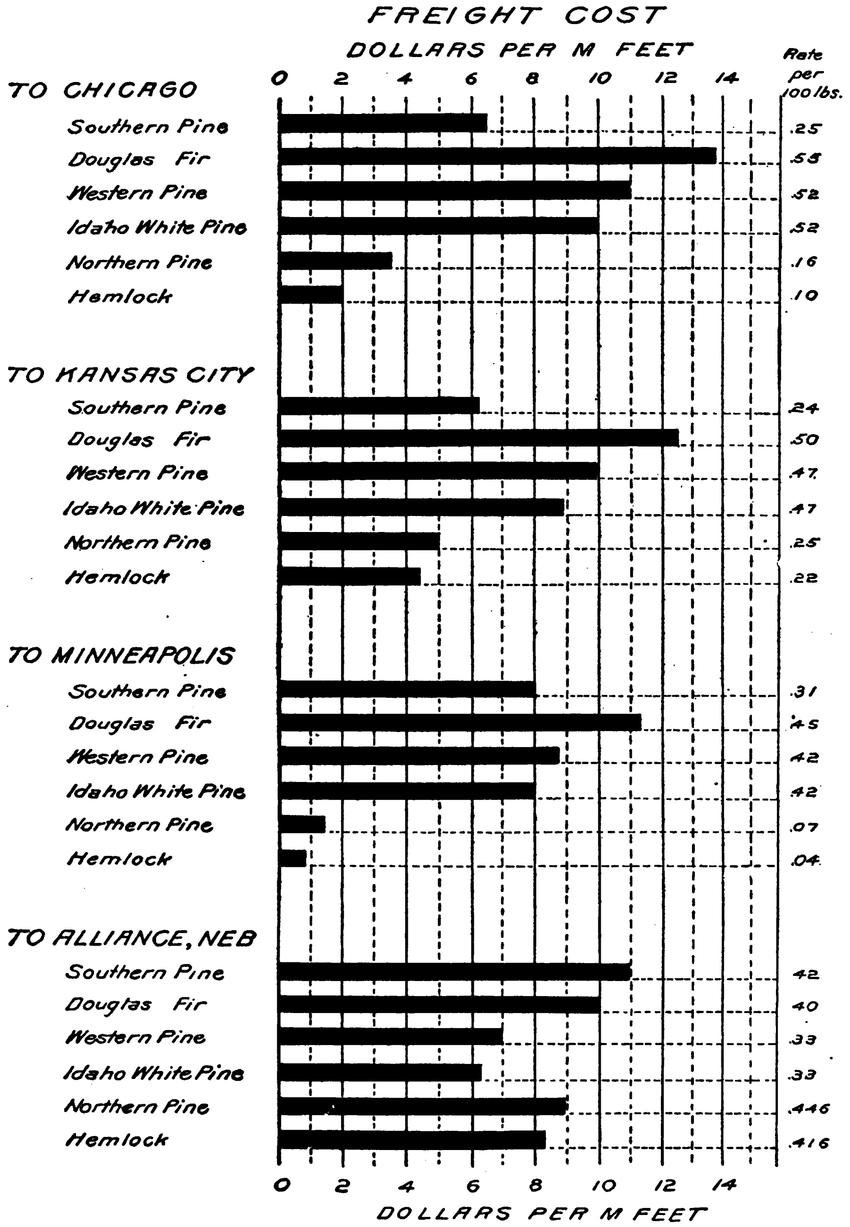


FIG. 7b.—Comparative freight rates on lumber from producing to consuming centers.

were all stock thoroughly seasoned before shipment. This is because of the fact that seasoning adds to the cost of lumber by reason of additional handling and increased equipment or investment.

The variation in freight charges incurred by lumber of the same species, grade, and size is illustrated by the list of shipments given below, which shows the actual footage bought and freight paid on 24-cent and 52-cent lumber rates. These figures are given as they were copied from the books of distributing companies.

TABLE 9.—*Freight paid on actual shipments.*

24-cent rate. Southern yellow pine No. 2 common boards, 1 x 6—12-16, S2S.		52-cent rate. Western pine No. 2 common boards, 1 x 12—16, S2S.		24-cent rate. Southern yellow pine No. 2 common boards, 1 x 6—12-16, S2S.		52-cent rate. Western pine No. 2 common boards, 1 x 12—16, S2S.	
Feetage bought.	Freight paid per M.	Feetage bought.	Freight paid per M.	Feetage bought.	Freight paid per M.	Feetage bought.	Freight paid per M.
19,089	$5.77	25,280	$10.81	19,180	$5.89	25,152	$11.26
22,684	5.57	28,976	10.92	17,690	5.35	28,528	10.47
10,572	4.25	24,128	11.27	21,203	5.58	29,200	10.53
19,602	5.33	28,160	11.08	17,172	5.96	29,040	10.62
21,256	4.61	23,312	11.42	26,199	5.10	21,528	11.30
12,757	6.35	29,584	11.34	22,883	6.00	29,466	10.55
17,624	5.21	29,040	11.65	14,861	6.47	28,640	10.80
19,516	5.53	27,824	11.49	18,050	5.52	30,208	10.33
11,633	6.70	27,568	11.53	20,312	4.93	27,632	10.82
15,364	6.98	27,216	11.43	20,172	5.29	25,744	10.55
20,668	5.59	26,352	11.16	17,915	6.57	30,128	11.37
16,915	5.04	25,744	10.81	20,000	4.88	28,928	11.90
19,320	5.54	27,840	10.72	23,732	4.81	21,426	11.02
10,954	6.67	40,096	10.94	18,876	6.73	30,006	10.90
19,844	6.49	28,400	10.93	19,670	5.06	27,914	10.21

In the few shipments listed it will be noted that there is a range between the maximum and minimum freight charge of $2.73 in the case of 1 by 6 inch southern pine and of $1.69 in the case of 1 by 12 inch western pine. The freight charges actually paid on 3,857,000 feet of 1 by 6 inch No. 2 southern pine on a 24-cent rate averaged $5.64 per thousand feet; and on shipments of 3,900,706 feet of 1 by 12 inch No. 2 western pine on a 52-cent rate, $10.42 per thousand feet. These shipments were carload purchases by different companies covering a period of three and one-half years ending in the middle of 1915. Variations from these averages in the 30 shipments quoted ranged from 20 per cent above to 20 per cent below in the case of the southern pine and from 14 per cent above to 2 per cent below in the case of the western pine. The effect of such variations upon mill prices is apparent.

The fact that the railroad cost of transportation is based upon weight has contributed largely to the so-called "undersizing" of lumber at the mills, by which material is dressed to a size often considerably less than the full selling dimensions. For example, both southern yellow pine and Douglas fir 2 by 4 inches dimension is in standard practice dressed to 1⅝ by 3⅝ inches; 2 by 6 inches dimension is dressed to 1⅝ by 5⅝ inches. Inch boards of yellow pine are dressed to ¹³⁄₁₆ inch, while in the case of Douglas fir they are dressed to ¾ inch. The standard size of western pine 2 by 4 inches dimension is 1⅝ by 3⅝ inches; of 2 by 6 inches dimension, 1⅝ by 5½ inches; and of inch common lumber, ¾ inch. This practice of dressing or sizing directly reduces the thousand feet weight of the lumber, because it is scaled and sold on the basis of full measure. Seasoning and sizing in order to reduce freight has in many instances been carried so far as seriously to injure the quality and strength of the lumber.

There is naturally a variation in weight between different grades of the same species because of the factors already mentioned, but intensified by different degrees of seasoning, sizing, and quality required of the different grades. These requirements arise from the use to which the lumber is adapted. High-grade lumber is more carefully seasoned and manufactured and is freer from knots, which add to weight, than the lower grades; consequently its average weight per thousand feet and the freight charges incident to its transportation are less. The following figures compiled from the purchases of two retail companies in Kansas City, Mo., will illustrate average differences in weight and transportation costs between different grades. The quantity, 5,250,000 feet, is not sufficient to reflect a broad average for these grades, and should not be so construed. The table further indicates the relative percentage which transportation costs bear to the delivered wholesale price of the classes of stock purchased by these companies during 1912, 1913, and 1914.

TABLE 10.—*Southern yellow pine yard stock.*

Grade.	Average delivered price Kansas City, per M.	Average freight paid per M.	Average weight in pounds per M.	Per cent freight cost to average—	
				Delivered price.	Mill price.
B and better	$25.82	$5.03	2,251	19.5	24.2
No. 1 Common	19.49	5.60	2,661	28.2	40.3
No. 2 Common	16.94	5.41	2,449	31.9	46.8
No. 3 Common	14.47	5.89	2,508	40.7	68.6

ESTIMATED SHIPPING WEIGHTS.

As a practical method of figuring delivered prices, lumber manufacturers use estimated weights for the various species and grades. These estimated weights are based on averages derived either from a great many shipments or from actual weight tests of the various grades. In figuring a delivered price per thousand feet, the shipper computes the freight charges on the estimated weight, taking whatever gain or loss may result from differences between the estimated weight and the actual weight. Estimated weights are therefore sufficiently high to protect the shipper against consistent loss. In many cases, in fact, underweight is a profit definitely counted on by the shipper. Table 11 shows the estimated weights in common use by shippers.

TABLE 11.—*Estimated weights in common use by shippers.*

Species.	Estimated shipping weight (pounds per thousand feet) dressed stock (dry).			
	Flooring (1 inch).	Finishing (1 inch).	Common boards.	Dimension (2 by 4 inches).
Southern pine:				
Longleaf	2,200	2,600	2,700	2,700
Shortleaf	2,000	2,500	2,500	2,500
Douglas fir	2,000	2,500	2,500	2,600
Western yellow pine	....	2,000	2,100	2,400
Idaho white pine	....	1,900	1,900	....
Northern white pine	2,000	2,000	2,000	2,500
Hemlock	....	....	2,000	2,200

Figure 7*b* shows the relative transportation charges per thousand feet based upon estimated shipping weights commonly used from central points in the producing regions to Chicago, Kansas City, and Minneapolis, and to Alliance, Nebr. These diagrams bring out graphically the great variation in transportation costs to which the species under discussion are subject in their distribution into the central territory. Most of the southern pine has until recently come into Chicago on a rate of either 24 or 26 cents per 100 pounds, and transportation on this species to Chicago has therefore been figured at an average of 25 cents per 100 pounds. A rate of 24 cents to Kansas City has been used, since the wholesale price at that point is figured from this rate although considerable material is shipped in at a lower cost. In these cases the difference between the lower rate and the 24-cent rate is a gain to the mill more fortunately situated. The case of Kansas City brings out the varying advantages which mills manufacturing the same species often have in point of transportation to a common market.

TABLE 12.—*Actual freights on yard stock.*

[Based on purchases of three retail companies.]

Year.	Feetage bought.	Freight actually paid.	Freight computed on 24-cent rate.	Gain to mills having lower rates.	
				Total.	Average per thousand.
1914	3,310,000	$18,003	$21,002	$2,999	$0.90
1913	5,324,000	29,375	32,600	3,225	.60
1912	4,740,000	27,923	29,901	1,978	.42
	13,374,000	75,301	83,503	8,202	.62

ACTUAL FREIGHTS ON YARD STOCK.

As illustrative of the varying proportion of freight costs per thousand feet on species carried in stock by retail yards in Kansas City, Table 13 is given:

TABLE 13.—*Mill cost, transportation cost, and delivered wholesale value per thousand feet of various species sold through retail yards in Kansas City, 1915.*

Species.	Cost f. o. b. mill.	Freight actually paid.	Cost f. o. b. Kansas City.	Per cent species distribution.
Yellow pine	$14.14	$5.79	$19.93	84.1
Douglas fir	14.90	10.03	24.93	2.4
Cypress	30.69	5.29	36.98	5.8
Redwood	12.73	3.82	16.55	.9
Oak	39.08	3.88	42.96	3.2
White pine	35.07	5.05	40.12	2.6
				[1] 99

[1] Remaining 1 per cent includes miscellaneous species, i. e., maple, poplar, hemlock, gum, cottonwood, birch, and hickory.

Average mill value per thousand feet, $16.47.
Average freight paid per thousand feet, $5.76. Average delivered value of stock per thousand feet, $22.23.

These data are based upon the actual costs paid in the purchases of two companies for three years and one company for nine months. The figures are of course dependent upon the assortment of stock carried of the different species, but they show approximately the average freight cost on current yard stocks in Kansas City. Approximately 85 per cent of the stock is southern pine, which in this region forms the bulk of the retail lumber trade. The stock of other species is largely for special uses. For example, the oak and Douglas fir is mostly flooring, the cypress is largely finish, and the redwood is siding. The total amount of lumber upon which the figures are based is 17,694,447 board feet; and the average freight represents actual transportation costs to Kansas City, at which point the lumber was unloaded into retail yards and later distributed to consumers by team.

INCIDENTAL TRANSPORTATION COSTS.

In addition to the transportation cost as determined by the freight rate per 100 pounds, certain miscellaneous costs are often incident to railway transportation. Among these are such items as demurrage, diversion, and reconsignment charges. Demurrage is a charge imposed by the railroads upon cars which are held by the consignor or the consignee in excess of the time allowed. Diversion is a change of shipment in transit to a new destination before it reaches its original destination, while reconsignment is a reshipment after lumber has arrived at its original destination. The usual or customary demurrage charge is $1 per car for every day the car is held in excess of the time allowed, which is commonly 48 hours from 7 o'clock on the morning following the receipt of the car. Rules governing demurrage, however, vary as between different railroads and freight association districts; and different regulations are often made by State railroad commissions for intrastate shipments. There is also much variation in the rules and regulations of the railroads regarding diversion and reconsignment privileges. For example, in some instances the privileges are granted free, and in others a charge of $2 per car for diversion and $5 per car for reconsignment is made.

Demurrage is incurred at the mills from lack of shipping facilities and from delays in loading cars which result from broken stocks or other conditions. In some instances mills consider it cheaper to pay demurrage on cars which are being loaded with special stock, on account of the saving in costs of handling. Demurrage charges are variable between mills and in different periods at the same mill but as a cost averaged against the total shipments constitute a very small charge per thousand feet. At the destination, demurrage results from the failure of the consignee to unload the car promptly and, in the case of transit cars, from the failure or inability of the dealer to reconsign or to sell the contents of the car prior to the expiration of the free time period. The latter charge often amounts to a considerable cost against the lumber held. This is shown by the figures in Table 14, which were obtained from a railroad handling southern pine.

TABLE 14.—*Demurrage costs in the shipment of lumber and other forest products.*

Period.	Number of cars upon which demurrage accrued.	Total demurrage.		Average demurrage.		
		In days.	In dollars.	Per car in days.	Per car in dollars.	Per M feet.
1915.						
March	107	1,124	910	10.5	8.50	$0.415
April	91	775	775	8.5	8.50	.415
May	122	1,238	1,235	10.1	10.12	.562

These figures represent shipments of lumber and other forest products. The average demurrage is computed on the basis that the average contents of the cars were equivalent to 18,000 feet. A large portion of the cars were at East St. Louis, where they were received from southern connections and held for reconsigning instructions. Figures were also obtained from the same company for the same period covering cars of lumber and other forest products carried to Chicago for unloading. These figures are used in Table 15:

TABLE 15.—*Demurrage paid on cars of lumber carried to Chicago for unloading.*

	Cars of lumber and other forest products received at Chicago for unloading.	Number of cars held for demurrage.	Percentage of cars held.	Number of days held.	Average number of days held per car.	Demurrage paid.	
						Per car.	Per M feet.
1915.							
March	369	19	0.051	111	5.8	$5.80	$0.32
April	339	30	.088	98	3.3	3.30	.18
May	278	24	.086	71	2.9	2.90	.16
Average	329	24	.075	93	4.0	4.00	.22

The significant feature of these figures is that during the period covered demurrage accrued on 7½ per cent of the cars delivered by this company for unloading in Chicago. It should be noted that as an average charge against the total feetage of all cars, demurrage is an almost negligible amount. The direct effect of the charge, however, falls upon the lumber so held and is felt in the influence of such lumber upon market price stability.

The figures are not given as representing the average demurrage charges incidental to lumber transportation, but merely as an index to this cost in present distribution. It is one of the innumerable expense variables affecting price stability and uniformity.

Other miscellaneous or incidental transportation costs result from damage to lumber in transit, which may be due to wrecks, the condition of the railway equipment, etc., from delays and misrouting of cars, and from the transfer of car contents and the mixing of the carload in transit. The latter is not uncommon in the case of mixed cars, and results from the lumber being insecurely loaded. The different grades thereby become mixed and additional cost is involved in unloading the car upon its arrival. The amount of loss and damage incurred in shipping lumber, as shown by the claims filed by shippers, is insignificant considering the total volume moved.

CARLOAD AND LESS THAN CARLOAD SHIPMENTS.

Reference has been made to the fact that freight rates on less than carload shipments are much higher than those applying to carloads. This makes the shipping of lumber in less than carload lots direct from the mill to redistributing centers and consuming points impracticable as a common practice, because of the increased transportation cost. While some lumber is shipped in less than carload lots, the practice is not general, particularly in softwoods, and is confined to special stock of which small amounts are necessarily carried in retail yards. This stock is usually obtained from the nearest wholesale yard, and retailers at the same point often club together to make up a carload order and obtain the lower freight rate. Catalogue houses likewise sell a small amount of lumber in less than carloads from concentration yards direct to consumer; but figures obtained from some of these concerns indicate that such shipments form a small percentage of their total sales and are restricted largely to near-by points. Table 16 shows the difference in transportation cost per thousand feet between lumber shipped in carload and in less than carload lots. Cairo, Ill., a gateway for southern lumber moving into the central territory, and Chicago, the main distributing point in the Middle West, have been used as points from which to figure the two sets of freight costs. The consuming points have been selected arbitrarily.

TABLE 16.—*Freight rates on lumber.*

Shipping point and destination.	Less than carload lots.		Carload lots.	
	Rate in cents per 100 pounds.	Rate per M feet.[1]	Rate in cents per 100 pounds.	Rate per M feet.[1]
From Cairo, Ill., to—				
Astoria, Ill	23.9	$5.97	9.5	$2.37
Barry, Ill	23.9	5.97	9.5	2.37
Champaign, Ill	20.8	5.20	9.5	2.37
Heyworth, Ill	20.8	5.20	9.5	2.37
Lincoln, Ill	21.1	5.27	9.5	2.37
Mansfield, Ill	21.1	5.27	9.2	2.30
Middletown, Ill	21.1	5.27	9.5	2.37
Pittsfield, Ill	23.9	5.97	9.5	2.37
From Chicago, Ill., to—				
Valparaiso, Ind	10.5	2.62	6.8	1.70
Crown Point, Ind	8.4	2.10	6.3	1.57
Laporte, Ind	10.5	2.62	7.4	1.85
Rensselaer, Ind	13.1	3.27	8.4	2.10
Knox, Ind	11.0	2.75	7.4	1.85
Elkhorn, Wis	15.0	3.75	6.0	1.50
Janesville, Wis	17.5	4.37	6.3	1.57
Monroe, Wis	17.5	4.37	8.0	2.00
Darlington, Wis	20.0	5.00	10.0	2.50
Albany, Wis	17.5	4.37	7.0	1.75
Evansville, Wis	17.5	4.37	6.3	1.57
Beloit, Wis	17.5	4.37	6.3	1.57
Clinton, Wis	16.0	4.00	6.3	1.57

[1] Weight basis=2,500 pounds per thousand feet.

AVERAGE FREIGHT COSTS.

Sufficient data have been given to reflect the great variability in the item of transportation in the final cost of lumber to the consumer. Table 17 indicates the average freight paid by lumber shipped from Idaho and Montana into the Central States during the year 1913.

TABLE 17.—*Freight costs on lumber shipments from the Inland Empire.*

States.	Feet shipped, M.	Average mill value per M feet.	Average freight cost per M feet.	Freight in percentage of mill value.
North Dakota	46,966	$17.10	$7.60	44.4
South Dakota	26,911	16.90	8.30	49.1
Minnesota	27,126	17.20	8.55	49.8
Nebraska	22,713	16.70	8.45	50.9
Kansas	2,127	16.45	10.20	62.1
Iowa	31,297	17.55	10.50	59.8
Missouri	3,447	17.40	10.70	61.6
Illinois	22,451	17.80	10.90	61.4
Wisconsin	20,139	17.25	11.00	63.9
Indiana	1,536	17.80	12.90	72.4
Average	....	17.20	9.15	53.3

Table 17 is based upon actual shipments to the different States and the actual mill prices received. The average freight is based upon the estimated weight of the assortment of stocks shipped to the different States and upon an estimated average rate applying to the shipments into each State. These averages are, of course, based on varying stock assortments, weights, freight rates, etc., and can not be applied in determining transportation costs on specific grades and sizes of lumber to particular points.

On the map (fig. 8) are shown estimated freight costs in 1913 for two grades of Douglas fir in relation to delivered wholesale prices at representative consuming centers in the Middle West. These figures can not be taken as reflecting average freight costs borne by lumber generally. They are for relatively long shipments. Very comprehensive data indicating average freight charges on lumber are contained in the Dahlberg Exhibit No. 1 (Interstate Commerce

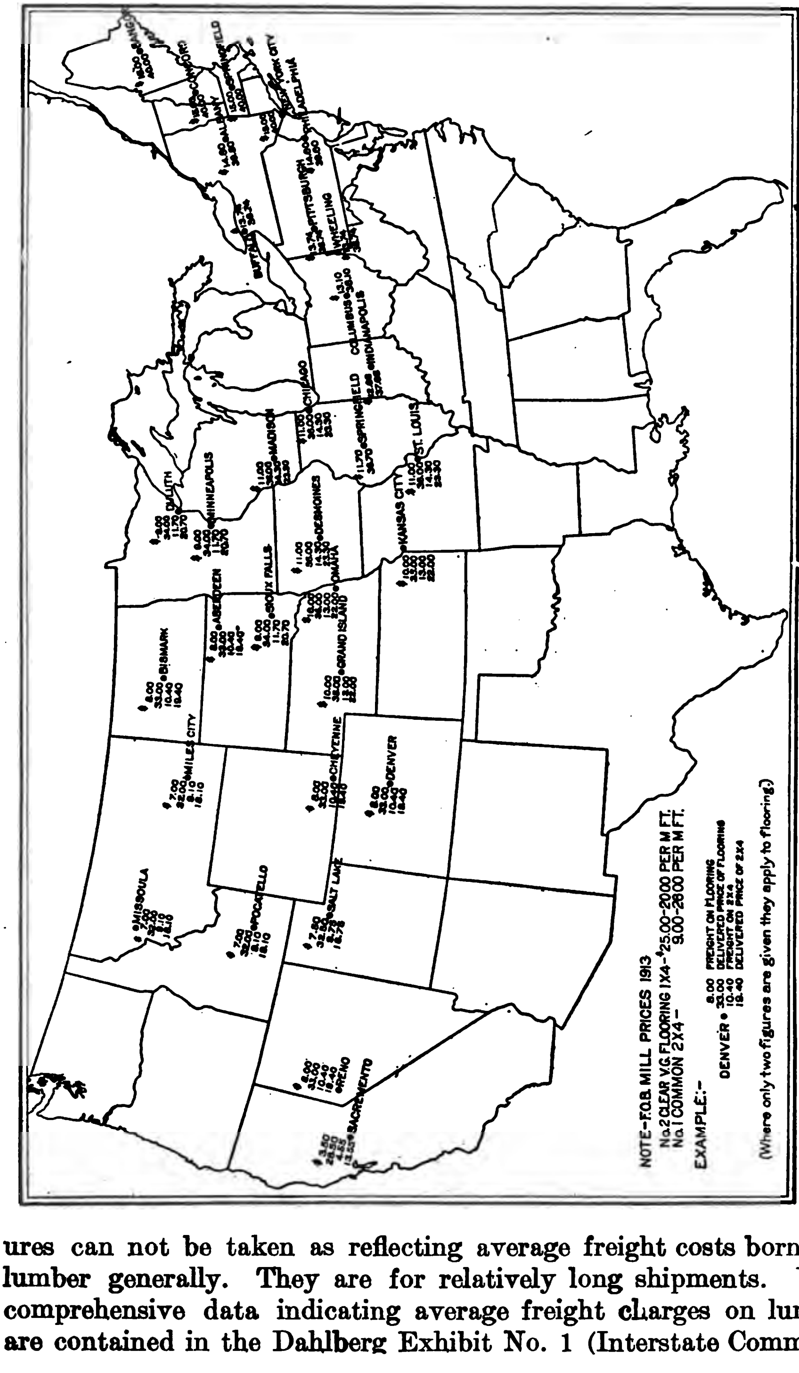

$ MISSOULA 7.00 32.00 8.10 16.10
$ 7.00 32.00 MILES CITY 8.10 16.10
$ 8.00 33.00 BISMARK 10.40 19.40
$ 7.00 32.00 POCATELLO 8.10 16.10
$ 8.00 33.00 10.40 19.40 RENO
$ 3.50 28.50 4.55 13.55 SACREMENTO
$ 7.80 32.80 8.75 16.75 SALT LAKE
$ 8.00 33.00 10.40 19.40 CHEYENNE
$ 8.00 33.00 10.40 19.40 DENVER
$ 8.00 33.00 ABERDEEN 10.40 19.40
$ 9.00 34.00 SIOUX FALLS 11.70 20.70
$ 10.00 35.00 GRAND ISLAND 13.00 22.00
$ 10.00 35.00 13.00 22.00 OMAHA
$ 10.00 35.00 13.00 22.00 KANSAS CITY
$ 9.00 34.00 DULUTH 11.70 20.70
$ 9.00 34.00 MINNEAPOLIS 11.70 20.70
$ 11.00 36.00 MADISON 14.30 23.30
$ 11.00 36.00 DESMOINES 14.30 23.30
$ 11.00 36.00 CHICAGO 14.30 23.30
$ 11.00 36.00 ST. LOUIS 14.30 23.30
$ 11.70 36.70 SPRINGFIELD
$ 12.86 37.86 INDIANAPOLIS
$ 13.10 38.10 COLUMBUS
$ 13.74 38.74 PITTSBURGH
$ 13.74 38.74 WHEELING
BUFFALO $ 13.74 38.74
$ 14.80 39.80 ALBANY
$ 14.60 39.60 PHILADELPHIA
$ 15.00 40.00 NEW YORK CITY
$ 15.00 40.00 SPRINGFIELD
$ 15.00 40.00 CONCORD
$ 15.00 40.00 BANGOR
NOTE-F.O.B. MILL PRICES 1913
No. 2 CLEAR V.G. FLOORING 1X4-$25.00-20.00 PER M FT.
No. 1 COMMON 2X4- 9.00-26.00 PER M FT.
EXAMPLE:-
DENVER • 8.00 FREIGHT ON FLOORING
33.00 DELIVERED PRICE OF FLOORING
10.40 FREIGHT ON 2X4
19.40 DELIVERED PRICE OF 2X4
(Where only two figures are given they apply to flooring.)

FIG. 8.—Freight cost and delivered wholesale prices in 1913 of Douglas fir (No. 2 clear vertical grain 1X4 Flooring and No. 1 Common 2X4 S. 1 S. 1 E.), shipped to representative cities of the United States.

Commission docket No. 8131). The following figures, taken from this exhibit, are based on shipments made by various manufacturers in different producing regions during the months of January, May, and September, 1915:

TABLE 18.—*Lumber shipments by various manufacturers in different producing regions.*

Region.	Total number of cars shipped.	Average rate per 100 pounds.	Average invoice value per carload f. o. b. mill.	Average haul per carload (miles).	Percentage of freight charges to invoice value f. o. b. mill.
Washington, Oregon, Idaho, Montana	2,210	$0.38	$327.88	1,257.1	63.1
California	1,000	.43	429.93	1,618.4	45.9
Upper Michigan, Wisconsin, and Minnesota	5,007	.12	408.38	380.5	14.1
Lower Michigan	1,250	.12	441.94	345.7	15.9
Kentucky and West Virginia	1,135	.17	419.80	453.6	19.6
Louisiana, Mississippi, Missouri, Arkansas, and Alabama	3,151	.20	371.78	746.4	25.9
North Carolina, South Carolina, and Virginia	1,922	.21	333.56	568.3	28.1
Florida and Georgia	1,450	.16	238.59	541.7	32.5
Total	17,125	.20	373.30	670.3	26.9

The average percentage of freight charge to invoice mill value, 26.9 per cent, is probably lower than the true average of all shipments from these regions. If the proportional cut of each region is taken into consideration, an average freight charge of from 33 to 35 per cent of the invoice price f. o. b. mill is obtained. In the same manner an average tonnage value f. o. b. mill of $14.65 may be obtained, from which it would follow that the average freight charge on lumber shipments by and large is approximately $5 per ton of 2,000 pounds. This is equivalent to approximately 26 per cent of the delivered wholesale price.

The Moore Exhibits Nos. 1 and 3, presented at the same hearing and containing a record of shipments from 27 lumber companies in the Southern Pine Association for 1914, show a percentage relationship of freight charges to f. o. b. mill value of 42.22 per cent. This is equivalent to $5.65 per 1,000 feet, on the basis of the average f. o. b. mill value of $13.38 shown by the exhibits, or 29 per cent of the delivered price.

In Table 1, page 29, the average freight shown on shipments of 2,758,917,000 feet, principally southern yellow pine, is $6.78 per 1,000 feet, or 28 per cent of the delivered selling price in the Middle West. This is equivalent to approximately 38 per cent of the f. o. b. mill value. Although the bulk of this lumber was sold in the Central States, it represents the sales of wholesalers at four large centers, and a certain percentage of it was probably shipped outside of the region in question.

DISTRIBUTION OF THE DELIVERED WHOLESALE PRICE.

Figure 9 shows graphically the average portions of the wholesale price taken by the different factors concerned in the distribution of the 2,758,917,000 feet of lumber referred to in the preceding paragraph.

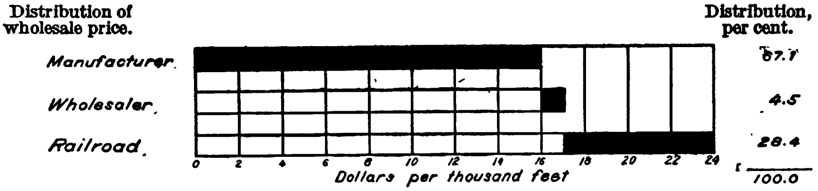


FIG. 9.—Distribution of wholesale price, based on general average of 2,758,917,000 feet, principally southern yellow pine, sold by wholesalers in Chicago, Kansas City, St. Louis, and Minneapolis during period 1908 to 1915, inclusive.

Figure 10 shows a similar distribution of the proportional gross costs on stock handled through several retail yards in Kansas City. The values are derived from Table 13, page 57. The figure shows the different elements which make up the f. o. b. wholesale price to the dealers in Kansas City, which, it should be borne in mind, is close to the yellow-pine producing region. To show with more specific accuracy the relative proportion of the actual wholesale price of lumber absorbed by freight, certain consuming points and specific grades have been selected (see Table 19). It should be borne in mind that these costs represent gross expenses and that they include in each instance all expenses and profits which go to make up the delivered wholesale price.

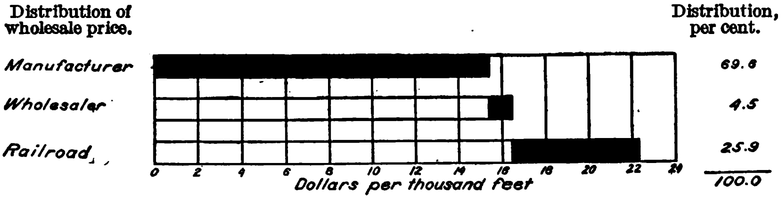


FIG. 10.—Distribution of wholesale price, based on wholesale purchases, 84 per cent southern yellow pine, of three retail yards in Kansas City from 1912 to 1914, inclusive. Distribution of delivered wholesale prices of lumber among manufacturer, wholesaler, and railroad.

In all of these graphic representations the cost of wholesaling is based on the average cost per cent shown by Table 1, evened off to the nearest 5 cents. Transportation costs are obtained from actual shipments and freights paid, except in figures 9 and 10, where they are based on estimated weights. Wholesale prices are taken from actual sales; mill values are derived by deducting the average wholesaling and transportation costs from delivered wholesale prices. The mill value includes the charge for standing timber, the raw material.

TABLE 19.—*The distribution of average delivered wholesale lumber prices among manufacturer, wholesaler, and railroad, as determined from 1912, 1913, and 1914 prices.*

Distribution of wholesale prices.	Southern yellow pine, Chicago.						Douglas fir, Chicago.	
	No. 1 dimension, 2 x 4-16, S. & E.		No. 2 boards, 1x6—12-16, S. & E.		F. G. flooring, B and better, 1 x 4.		V. G. flooring, No. 2 Clear, 1 x 4.	
	Price.	*Per cent.*	*Price.*	*Per cent.*	*Price.*	*Per cent.*	*Price.*	*Per cent.*
Manufacturer	$12.00	62.83	$9.80	58.33	$17.60	72.73	$20.50	62.12
Wholesaler	.85	4.45	.75	4.47	1.10	4.54	1.50	4.55
Railroad	6.25	32.72	6.25	37.20	5.50	22.73	11.00	33.33
Total[1]	19.10	100.00	16.80	100.00	24.20	100.00	33.00	100.00

Distribution of wholesale prices.	Southern yellow pine, Kansas City.			
	No. 1 dimension, 2 x 4-16, S. & E.		Finishing, B and better, 1 x 6—8.	
	Price.	*Per cent.*	*Price.*	*Per cent.*
Manufacturer	$12.05	64.10	$21.90	75.00
Wholesaler	.85	4.52	1.30	4.45
Railroad	5.90	31.38	6.00	20.55
Total[1]	18.80	100.00	29.20	100.00

Distribution of wholesale prices.	Douglas fir, Minneapolis.				Douglas fir, Alliance, Nebr.			
	V. G. flooring, No. 2 Clear, 1 x 4.		No. 1 dimension, 2 x 4-16, S. 1 S. 1 E.		No. 1 common boards, 1x12—12-16, S. 1 S.		No. 1 dimension, 2x12—12-16, S. 1 S. 1 E.	
	Price.	*Per cent.*	*Price.*	*Per cent.*	*Price.*	*Per cent.*	*Price.*	*Per cent.*
Manufacturer	$20.35	66.18	$6.80	35.14	$10.50	48.95	$8.71	42.63
Wholesaler	1.40	4.55	.85	4.39	.95	4.43	.92	4.50
Railroad	9.00	29.27	11.70	60.47	10.00	46.62	10.80	52.87
Total[1]	30.75	100.00	19.35	100.00	21.45	100.00	20.43	100.00

[1] Average delivered wholesale price, based on 1912, 1913, and 1914 prices.

WHOLESALE LUMBER PRICES.

Wholesale prices of softwood lumber in the Middle West are subject to frequent and wide fluctuations, particularly in the case of low grades necessarily produced in the heaviest volume. These are subject to keener competition than the higher or special grades. The species also which are produced in relatively small quantities and command special markets, like northern white pine, appear to fluctuate less in price than those manufactured in heavy volume like southern yellow pine and Douglas fir.

Wholesale prices are sensitive both to conditions at the mills and lumber markets and to general business movements. The extent of mill stocks and particularly the tendency toward overproduction exert an important influence. Periods of general business depression, such as parts of 1914 and 1915, have witnessed the

greatest demoralization of wholesale lumber prices and apparently the keenest competition in marketing.

Grade manipulations, whether to deceive the consumer or designed better to meet his needs, are often disturbing elements in price stability. The " ethical " blending of grades and similar practices need to be more open in order that the trade may not be misled as to the quality of the material sold.

DEFINITION OF WHOLESALE PRICE.

The wholesale market price of lumber may be defined as the delivered price made to large consumers and retail dealers who buy more or less continuously in carload lots. This price is made up of the net amount received by the mill, the freight to the locality where delivered, and the gross wholesaling margin. It includes, therefore, all costs and profits incident to manufacture, transportation, and wholesale merchandising. The relative portion of the wholesale price which these three transactions absorb have been shown specifically. The information presented in this section is designed to give an understanding of wholesale prices, their prevailing trend during the past three or four years, and the principal conditions other than costs which influence them.

TREND IN WHOLESALE PRICES.

Table 20 shows the grades and species upon which price data were obtained, together with the number of transactions upon which these prices are based. Curves showing the range and general trend of wholesale prices for specific grades of pine and fir are given in figures 11 to 17*g* inclusive.

In all cases the curves are based on monthly prices actually paid for lumber, as shown by invoices, purchases, or sales records. Thus they not only represent the trend in market fluctuation, but furnish a close index to the prevailing market price during the months and years given. List prices have not been used. The study has included only grades which are widely and continuously used in the retail and remanufacturing trade—such as the sash, door, and blind industry and box factories. In this connection, it must be borne in mind that a wholesale market price of lumber exists only in tables of averages struck from a number of sales. In interpreting the price data given in this report, the reader is cautioned that the figures represent only averages of a number of actual sales, and not the average of all sales made in the market. A further qualification in this respect is that the prices were plotted in some instances by date of invoice rather than date of sale. Fluctuations in every instance thus may not be reflected precisely at the time they occur. They are shown, however, with sufficient accuracy to meet all practical purposes, as indicated by their close correlation with fluctuations in the f. o. b. mill prices.

TABLE 20.—*Basis of price statistics.*

Basis rate point.	Species.	Grade and size.	Number of sales.					Number of firms from whom data were obtained.
			1912	1913	1914	1915 to May	Total.	
Chicago, 24-cent and 26-cent rate.	Southern yellow pine.	Flooring B. & B., F. G., 1x4.	71	78	47	15	211	13
		Finished B. & B., 1x6—8, rough.	38	51	45	27	161	6
		No. 1 common boards, S. 2 S., 1x8—10-12-16.	69	48	49	11	177	9
		No. 2 common boards, S. 2 S., 1x8—10-12-16.	42	59	94	21	216	12
		No. 1 common dimension, S. & E., 2x4—16.	53	57	94	33	237	14
		No. 2 common boards, S. 2 S., 1x6—12-16.	127	106	108	49	390	10
		No. 3 common boards, S. 2 S., A. W. & A. L.	48	36	50	12	146	5
Chicago, 52-cent rate.	Western yellow pine.	No. 2 shop, 5/4 & 6/4, S. 2 S.	23	28	34	14	99	8
		No. 4 boards, A. W. & A. L.	54	21	24	25	124	5
		No. 2 common, 1x12-16, S. 2 S.	85	81	79	47	292	6
		Common select, S. 2 S., 1x12—16.	21	35	55	26	137	3
55-cent rate.	Douglas fir	Flooring No. 2, clear, 1x4, V. G.	......	......	......	......	......	....
Kansas City, 24-cent rate and less.	Southern yellow pine.	No. 1 common dimension, 2x4—16, S. & E.	Record of number of sales not kept.					5
		No. 2 common dimension, 2x4—16, S. & E.						5
		Finishing B. & B., 1x6 and 8, S. 2 S.						5
		No. 1 common boards, 1x10—12-16, S. 2 S.						5
		No. 2 common boards, 1x10—12-16, S. 2 S.						5
		No. 2 common boards, 1x6—12-16, S. 2 S.						5
Minneapolis, 45-cent rate.	Douglas fir	No. 1 common dimension, 2x4—16, S. 1 S. 1 E.	Record of number of sales not kept.					2
		No. 2 clear & B. drop siding, 1x6—10-16.						2
		No. 1 common boards, 1x8—10-16, S. 1 S.						2
		Flooring No. 2 clear, 1x4, V. G.						1
Omaha, Nebr., 50-cent rate.	Douglas fir	Common dimension 2x4—16, S. 1 S. 1 E.	115	111	93	37	356	3
		Flooring No. 2, clear, 1x4, V. G.	41	79	78	30	228	4
		Common boards, 1x8—16, S. 1 S., or S. L.	25	50	36	9	120	2

By reference to figure 23, page 82, the manner in which the curves have been constructed will be clear. Each dot represents a specific wholesale purchase at the price and for the month shown. In most instances all purchases were taken, but this was not always possible. After these prices, taken from a number of different companies, were platted, curves were drawn to reflect the average of all data obtained on each grade item. It should be held in mind, therefore, that the prices in individual sales ranged above and below the curves, which represent the levels around which they centered during the period covered. These variations are discussed more fully on pages 81 and 82.

Fig. 11

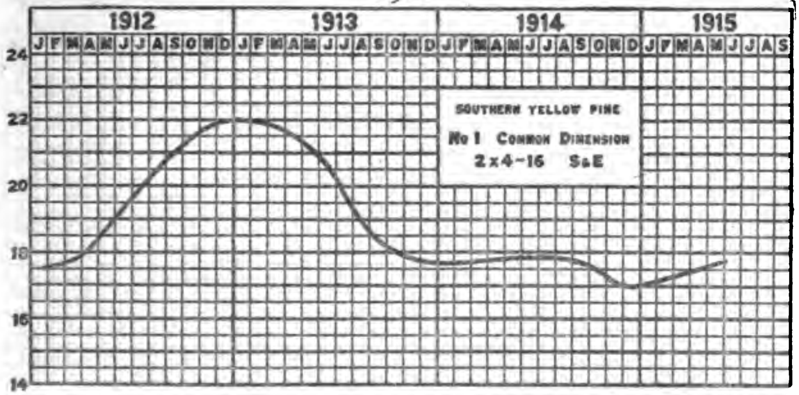


Fig. 11a

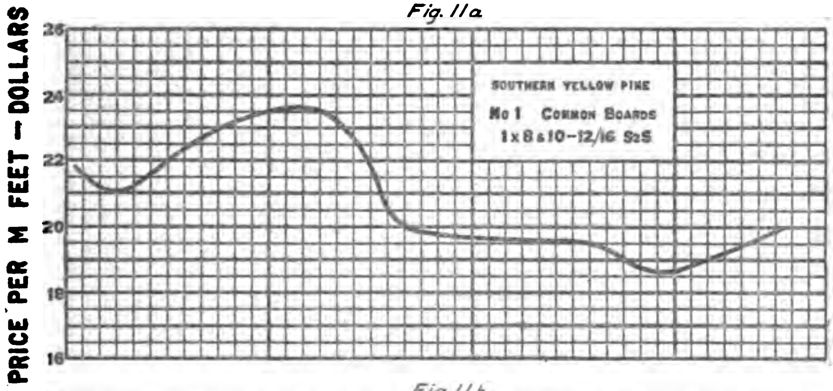
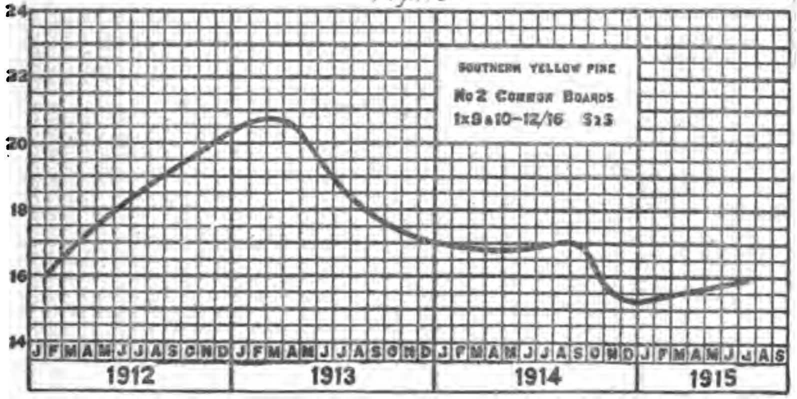
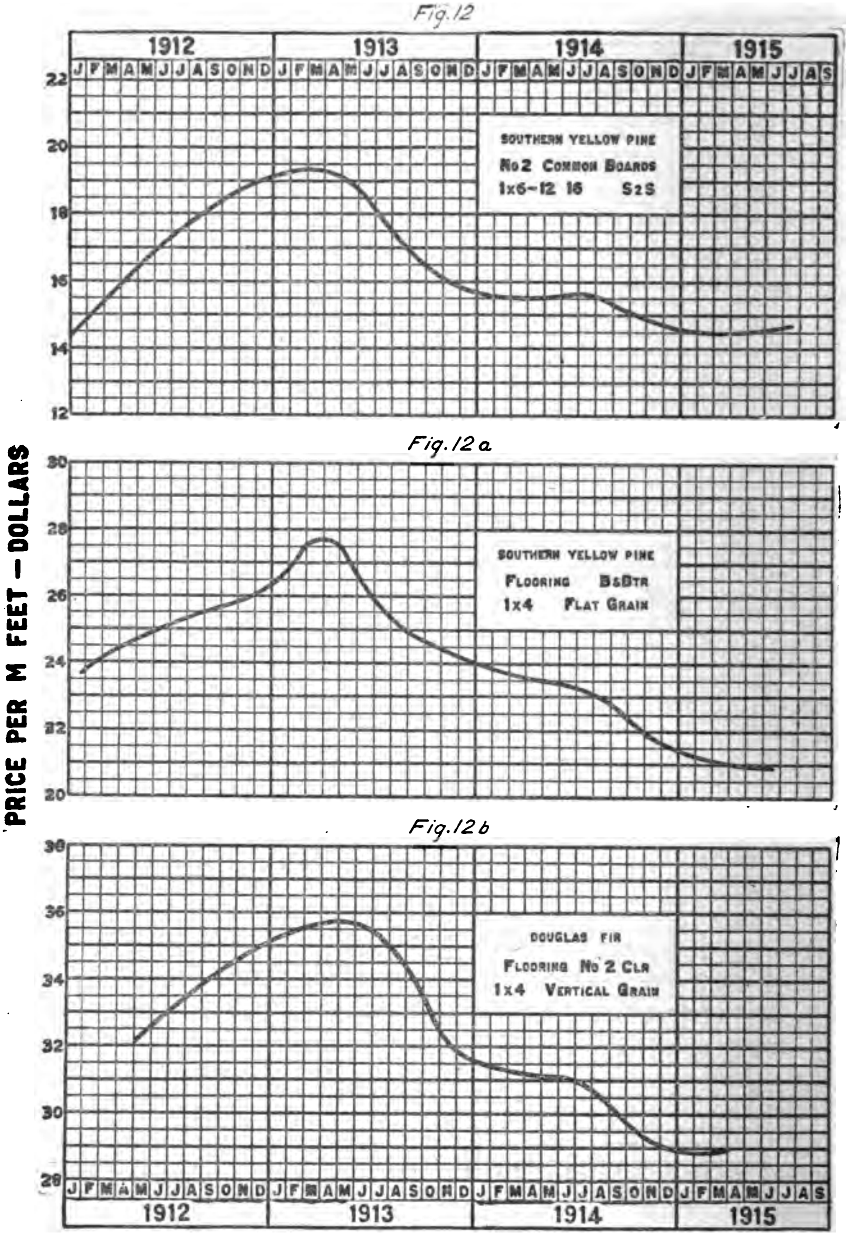


Fig. 11b



FIGS. 11, 11a, 11b.—Course of wholesale prices, Chicago, as reflected by current sales.



FIGS. 12, 12a, 12b.—Course of wholesale prices, Chicago, as reflected by current sales.

Fig. 13

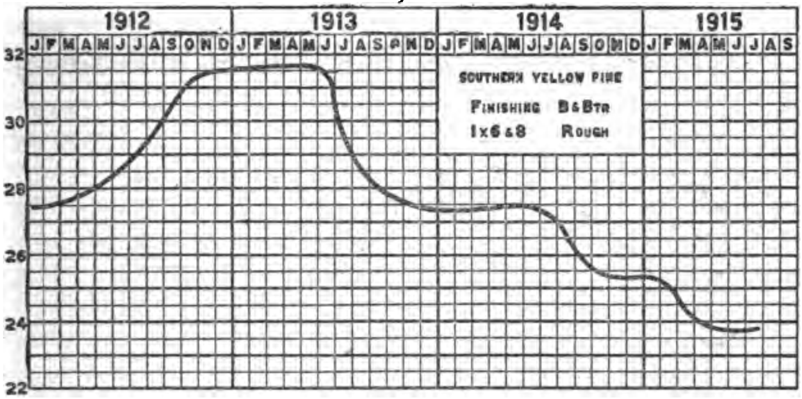


Fig. 13 a

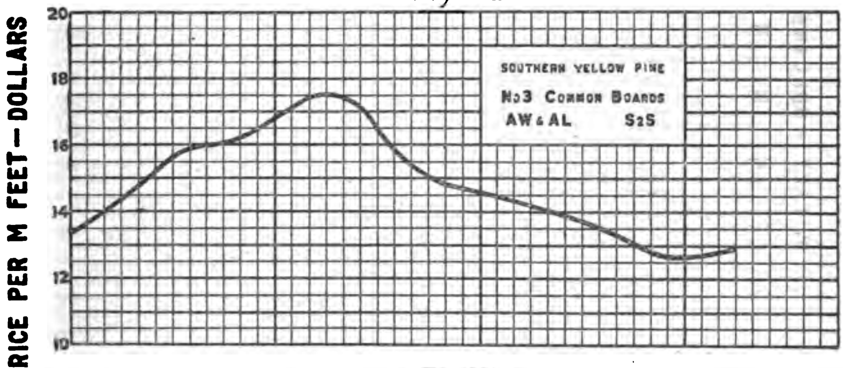
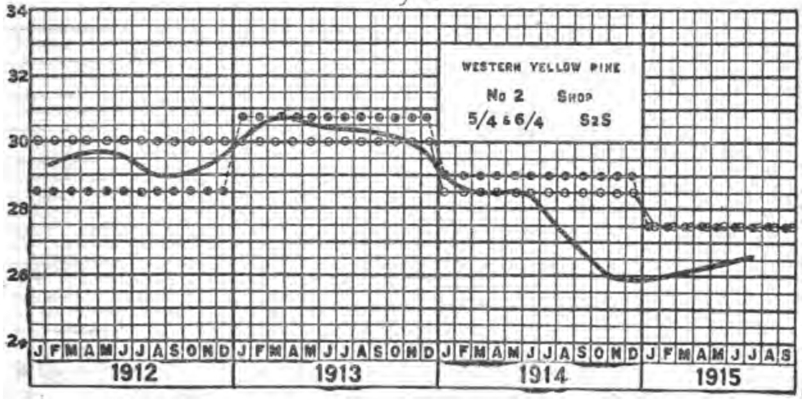


Fig. 13 b



FIGS. 13, 13a, 13b.—Course of wholesale prices, Chicago, on three items of factory stock. Figure 13b shows contract buying in relation to prevailing market trend. Circles represent actual prices at which two companies contracted their annual requirements.

Fig. 14

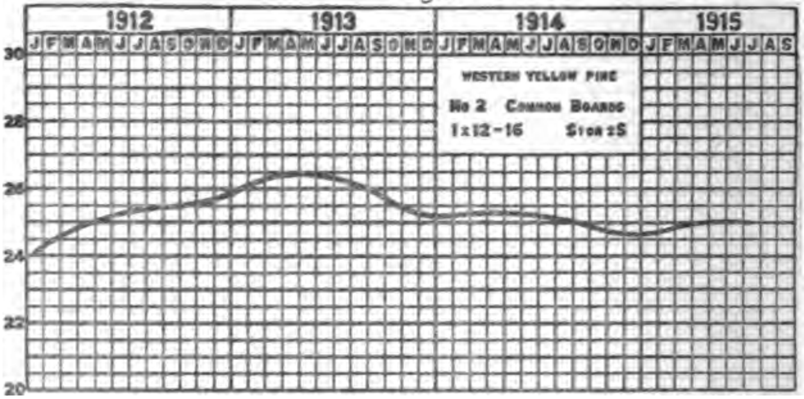


Fig. 14 a

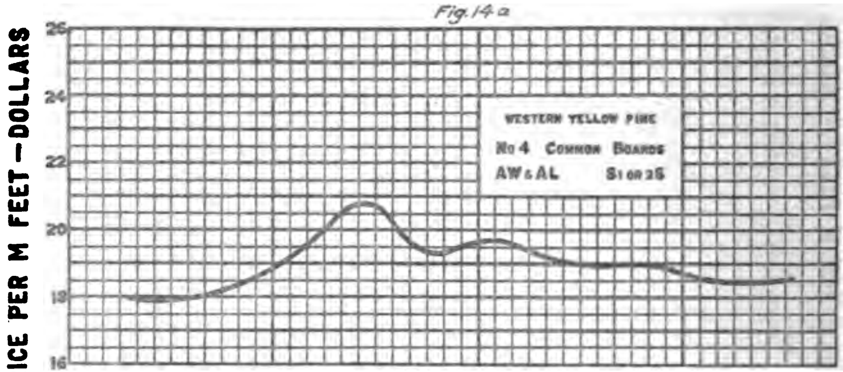
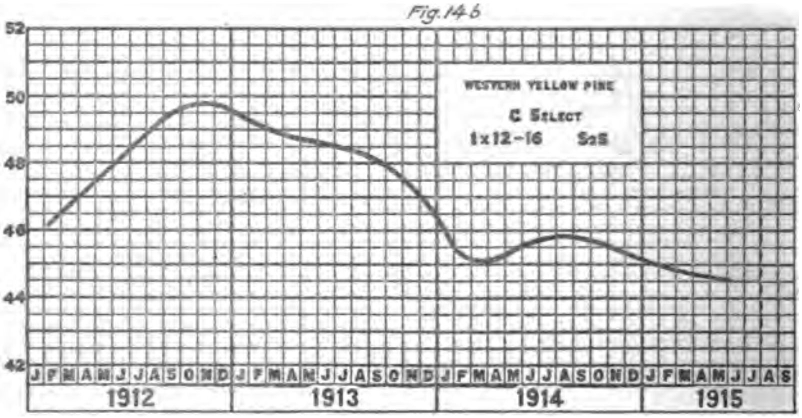
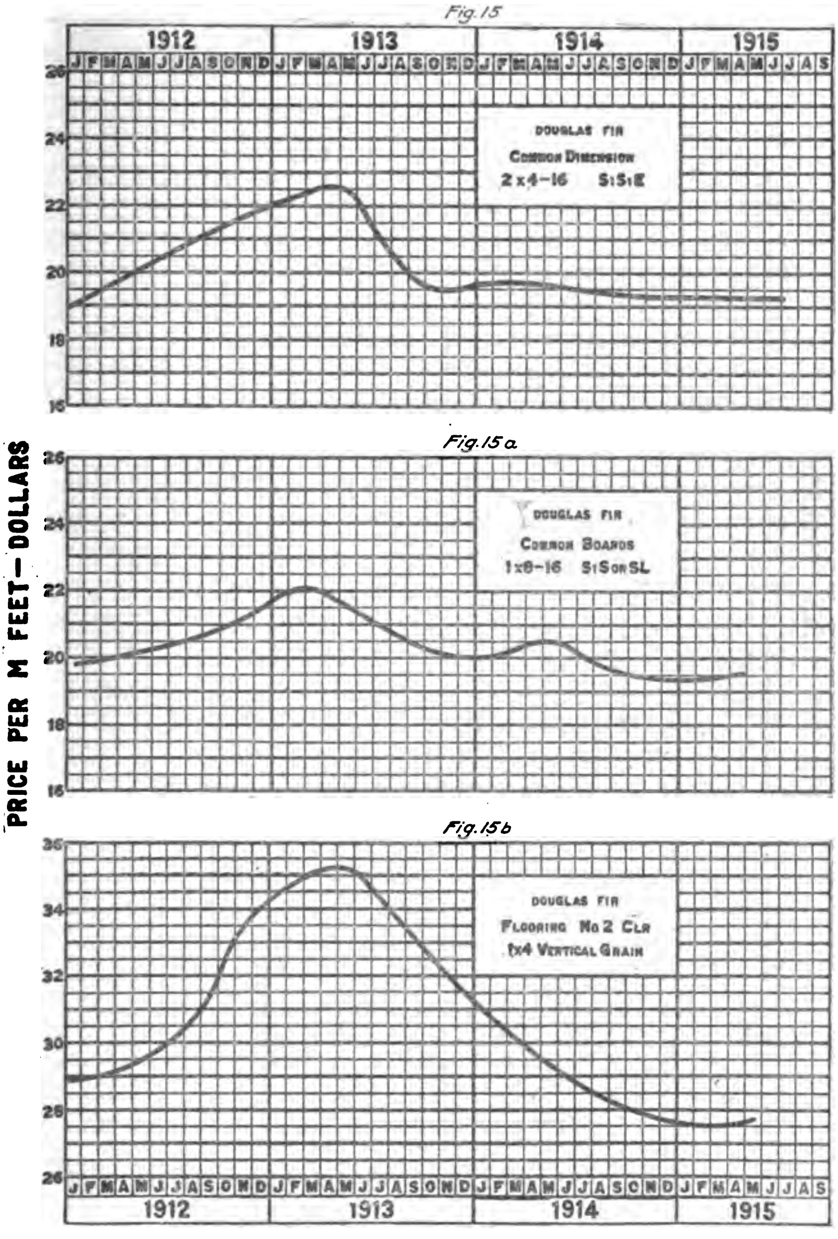


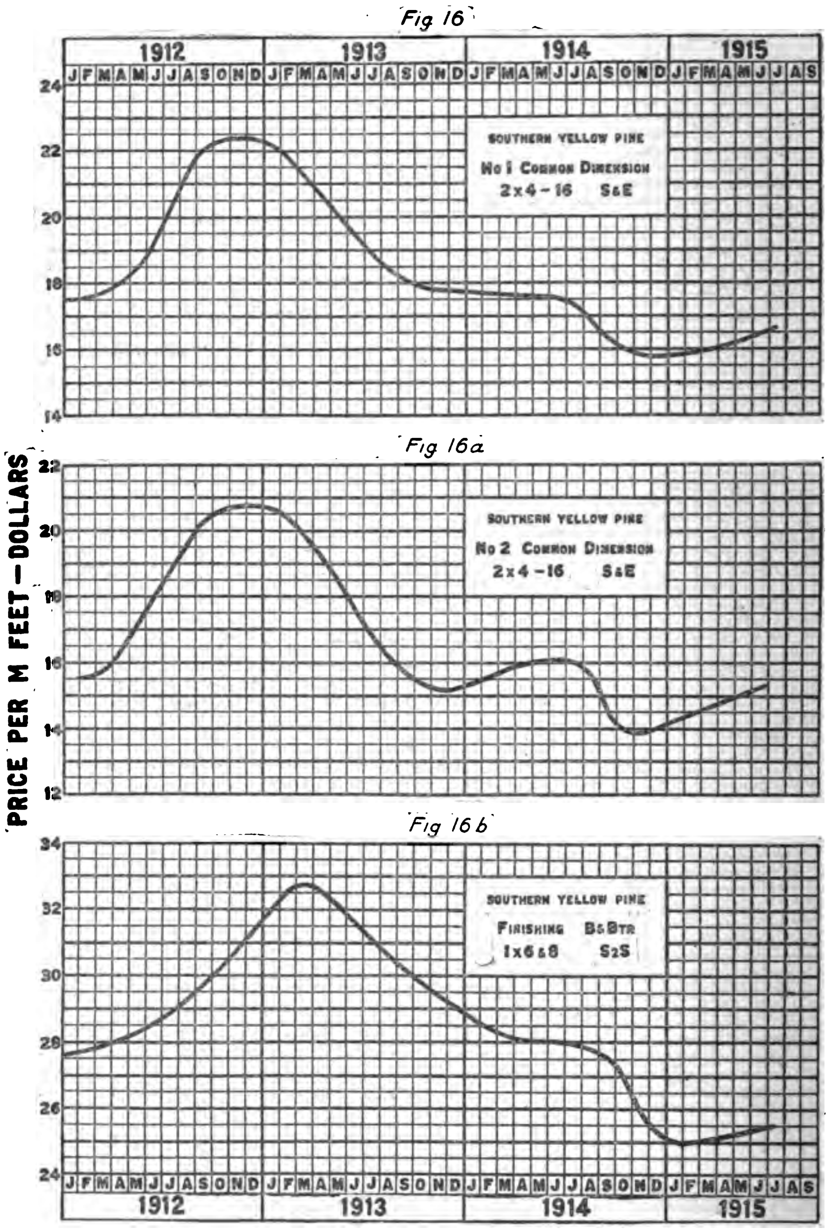
Fig. 14 b



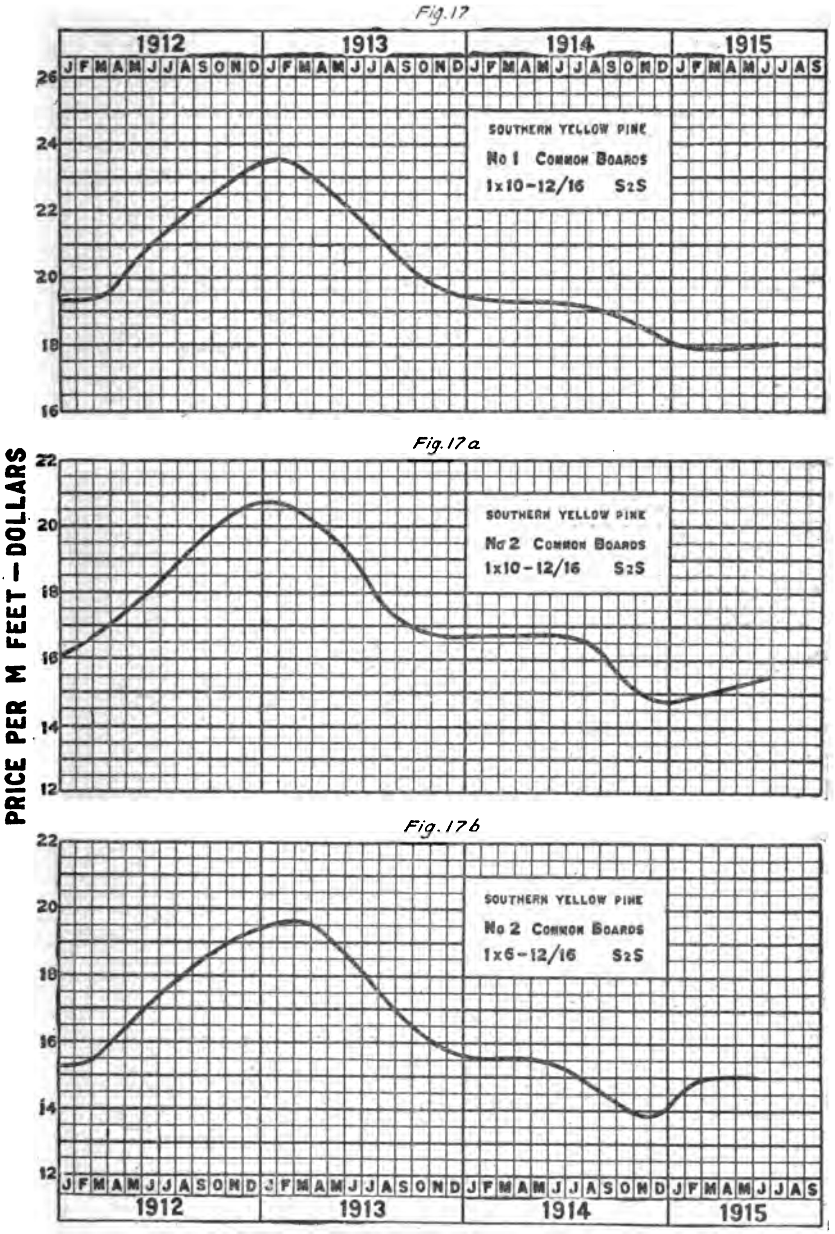
FIGS. 14, 14a, 14b.—Course of wholesale prices, Chicago, as reflected by current sales.



FIGS. 15, 15a, 15b.—Course of wholesale prices, Omaha, Nebr., as reflected by current sales.



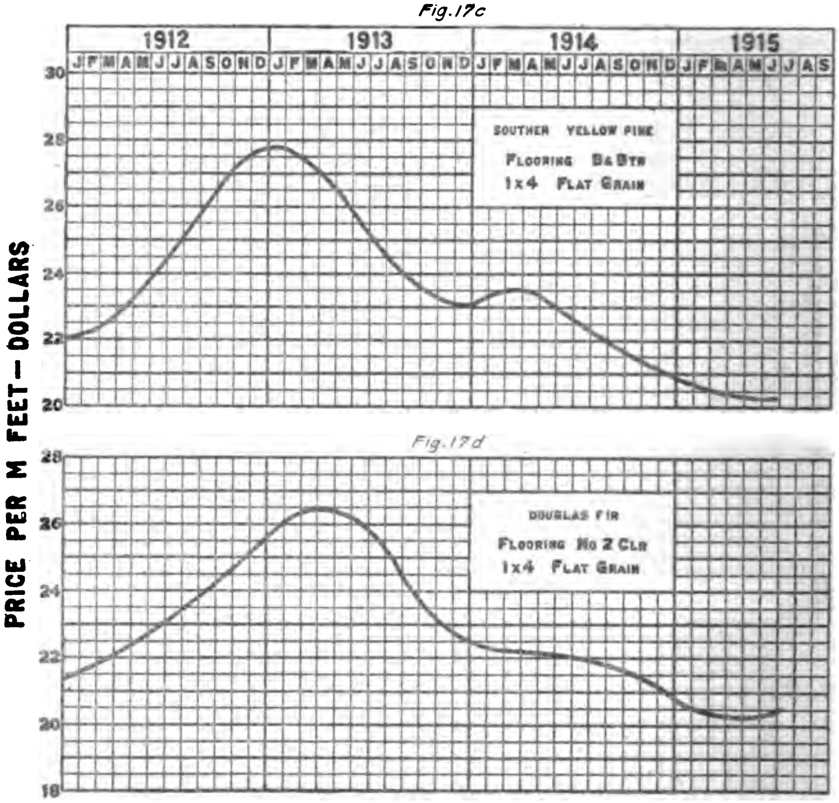
Figs. 16, 16a, 16b.—Course of wholesale prices, Kansas City, Mo., as reflected by current sales to five retail companies.



FIGS. 17, 17a, 17b.—Course of wholesale prices, Kansas City, Mo., as reflected by current sales to five retail companies.

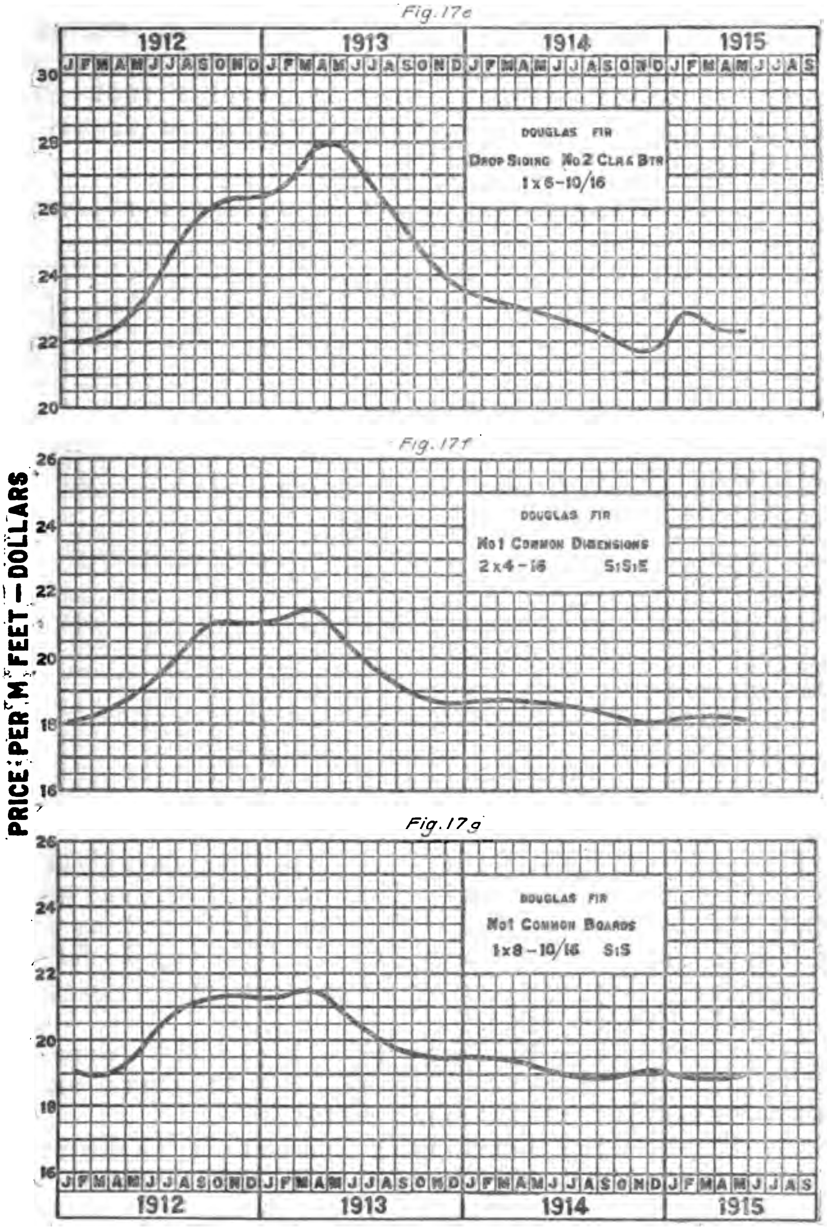
CURRENT FLUCTUATIONS IN WHOLESALE PRICES.

From a study of the foregoing curves it will be clear that other factors in addition to the cost of production, transportation, and distribution exert a powerful influence upon the wholesale price of lumber. Variations in price do not always or proportionally indicate the existence of competition. They may reflect other factors like volume of demand, financial depressions, or war conditions even in industries where competition is more or less restricted. That there is at least a considerable degree of competition in the wholesale marketing of lumber, however, seems to be evident from the diagrams, particularly in the periodic fluctuations indicated by the curves and the range of fluctuations given in Table 21.



FIGS. 17c and 17d.—Course of wholesale prices, Kansas City, Mo., as reflected by current sales to five companies.

Table 21 shows the highest and lowest of the average monthly prices on various grades of lumber upon which statistics were collected during 1912, 1913, and 1914, as well as the average price through the entire period. Attention is directed to the severe



FIGS. 17e, 17f, 17g.—Course of wholesale prices, Minneapolis, Minn., as reflected by current sales.

fluctuations in the price of yellow pine and Douglas fir, with differences between the low and high prices of some grades of as much as $7 and $8 per thousand feet. Fluctuations are less in the case of western yellow pine. It will be noted in all cases that prices at the beginning of 1912 were low and that an upward trend beginning after the first of the year culminated about the middle of 1913. Prices during the entire period were at their highest level in the last half of 1912 and the first half of 1913.

TABLE 21.—*Maximum and minimum of average monthly prices during 1912, 1913, and 1914.*

Grade and size.	Highest price		Lowest price.		Difference in price.	Average of monthly prices, 1912, 1913, 1914.
	Date.	Price.	Date.	Price.		
Minneapolis, Minn.—Douglas fir:						
Common dimension, 2 × 4-16, S. 1S. 1E	Mar., 1913	$21.90	Nov., 1914	$17.65	$4.25	$19.37
No. 1 common, 1 × 8 and 10, S. 2S. or S. L.	Jan., 1913	21.50	Aug., 1914	18.75	2.75	20.08
1 × 4 No. 1 V. G. flooring	Dec., 1912	37.60	Dec., 1914	28.85	8.75	33.66
1 × 4 No. 2 V. G. flooring	Nov., 1912	35.75	Jan., 1912	27.50	8.25	30.73
1 × 6 10-16 No. 2 clear and better, D. S.	May, 1913	28.50	Dec., 1914	21.30	7.20	24.29
1 × 8 No. 2 clear and better, finish	Apr., 1913	37.50	Jan., 1912	29.50	8.00	33.32
Omaha, Nebr.—Douglas fir:						
Common dimension 2 × 4-16, S. 1S. 1E	May, 1913	22.79	Dec., 1914	19.15	3.54	20.35
No. 1 common 1 × 8 S. 2S. or S. L	Jan., 1913	22.25	Nov., 1914	19.25	3.00	20.57
1 × 4 No. 2 clear and better fir flooring	Apr., 1913	35.46	Dec., 1914	27.25	8.21	31.25
Chicago basis—Western pine:						
1 × 12-16 C Sel. S. 2S	Nov. 1912	51.00	Dec., 1914	44.66	6.34	47.39
1 × 12-16 D Sel. S. 2S	Nov., 1912	36.37	Dec., 1914	28.93	7.44	32.32
No. 4 boards A. W. and A. L., S. 2S	Feb., 1913	21.25	Dec., 1914	16.50	4.75	18.66
No. 2 boards 1 × 12-16 S. 2S	May, 1913	26.84	Dec., 1914	24.05	2.79	25.42
No. 2 shop 5/4 and 6/4	Apr., 1913	30.75	Nov., 1914	25.90	4.85	29.18
Chicago basis–Southern yellow pine:						
1 × 4 B and B flooring, flat grain	Apr., 1913	27.92	Nov., 1914	21.70	6.22	24.19
1 × 8 and 10, No. 1, common, S. 2S. S. L.	Dec., 1912	24.25	Dec., 1914	18.00	6.25	21.03
1 × 8 and 10, No. 2, common, S. 2S. S. L.	Feb., 1913	22.12	Dec., 1914	14.93	7.19	17.91
1 × 6 No. 2, S. 2S., standard length	Mar., 1913	19.44	Dec., 1914	14.05	5.39	16.79
2 × 4-16 No. 1, S. 1S. 1E	Mar., 1913	22.58	Nov., 1914	16.81	5.77	19.10
1 × 6 × 8, B and B yellow pine, finish	May, 1913	32.00	Oct., 1914	25.00	7.00	30.53
No. 3 Common boards, A. W. and A. L.	Apr., 1913	18.63	Dec., 1914	12.33	6.50	14.93

Figure 18 compares the fluctuations in the average monthly price of several representative grades of yellow pine, Douglas fir, and western pine. The fluctuations in lime, steel beams, and wire nails have been included in this diagram for comparison. In order that the data may be comparable they have been plotted as percentages of the average f. o. b. mill or factory price.

These figures show the severe fluctuations which occurred in Douglas fir and yellow-pine grades of No. 1 Dimension, and the yellow-pine grade of No. 2 Common boards.

The data also afford an interesting comparison of the fluctuations existing in the Middle West in yellow pine and Douglas fir No. 1 Dimension 2 by 4 inches—16 feet. It will be noted that the curves are very similar. Since these species are in direct competition in markets like Omaha, it is to be expected that their prices should show the same trend, and that both should reflect severe fluctuations. These are due not only to the competition between manufacturers of the same species, but particularly to the direct competition between the two woods.

In the case of No. 2 Common boards of western and southern yellow pine, a wide difference in fluctuations is shown. While the general trend in price is the same, comparatively slight fluctuations affected western pine. This seems to indicate less competition in marketing such material, which is not sold to a large extent in the Middle West. In figure 20 a comparison of the fluctuations in the price of this grade with those in the price of western pine No. 2 shop is given. Somewhat severer fluctuations appear in the latter grade, which comes into direct competition with B and Better southern pine finish in Middle Western markets, large quantities of both being

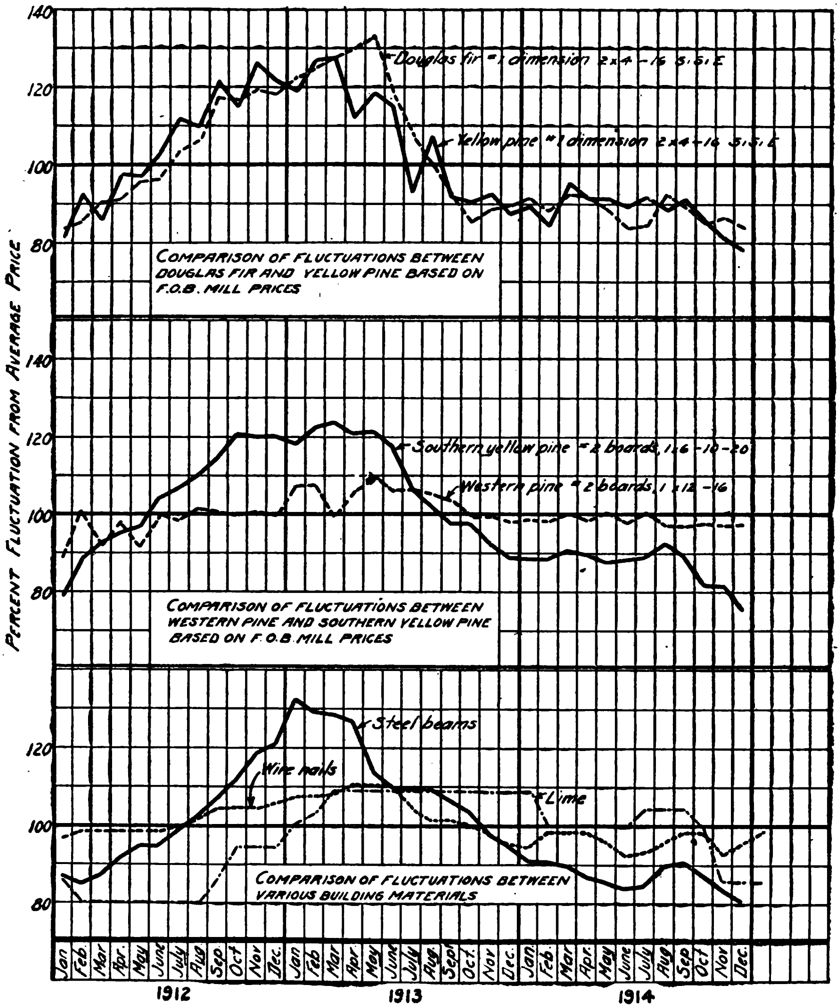
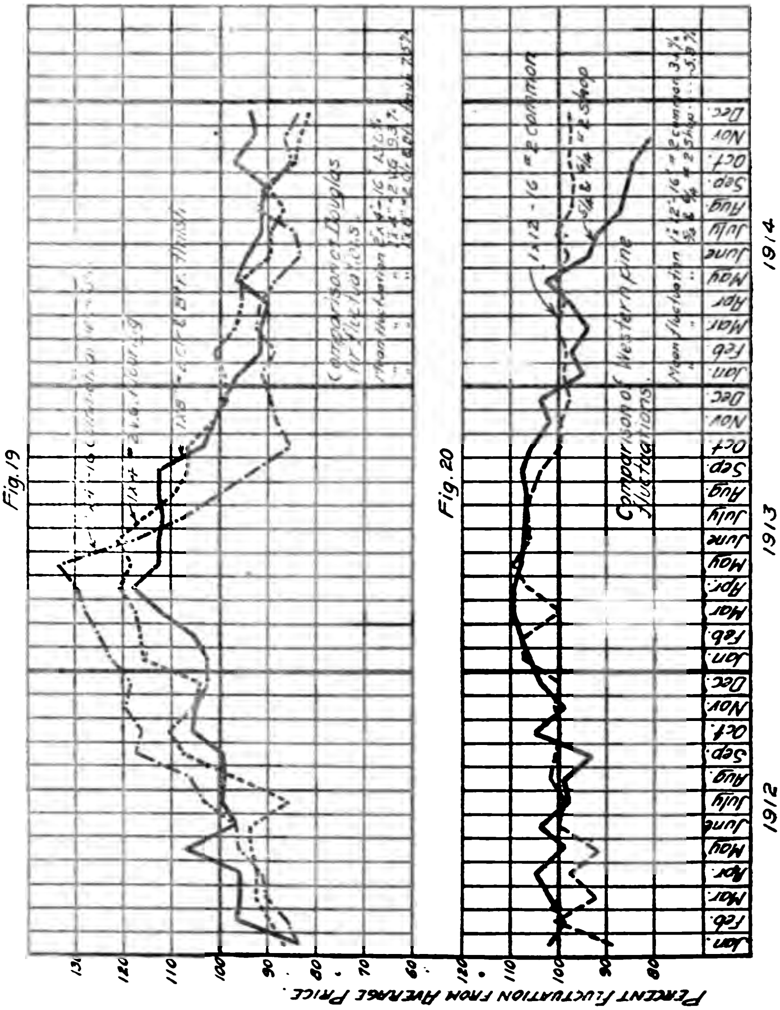


FIG. 18.—Comparison of fluctuations in wholesale prices between different species and various building materials.

used in the manufacture of sash, doors, blinds, etc. By reference to Table 21 it will be noted that the range of fluctuations on these two grades during the period is greater in the case of southern pine. The explanation appears to be that western pine manufacturers, as a general rule, have been able to hold stocks of their material at the mills during periods of depression, selling when better price conditions obtained, and have not been forced to throw their lumber on the market regardless of price conditions to the same extent as southern yellow pine and Douglas fir mills.



FIGS. 19 and 20.—Comparison of fluctuations of Douglas fir and western pine.

Differences in the range of fluctuations are likewise marked between grades of the same species. This is shown by figure 19, in which the percentage fluctuation of three grades of Douglas fir have been plotted from Omaha prices. In figure 21 similar price fluctuations at Chicago are shown for five grades of southern pine. In all cases it will be seen that the greatest fluctuations have occurred in the lower grades of lumber, which constitute the larger part of the output of the mills and consequently are subject to much severer competition in marketing than is the case with the higher grades. This conclusion is substantiated by the comparison of mean fluctuations of different grades upon which wholesale prices were obtained, shown in figure 21*a*.

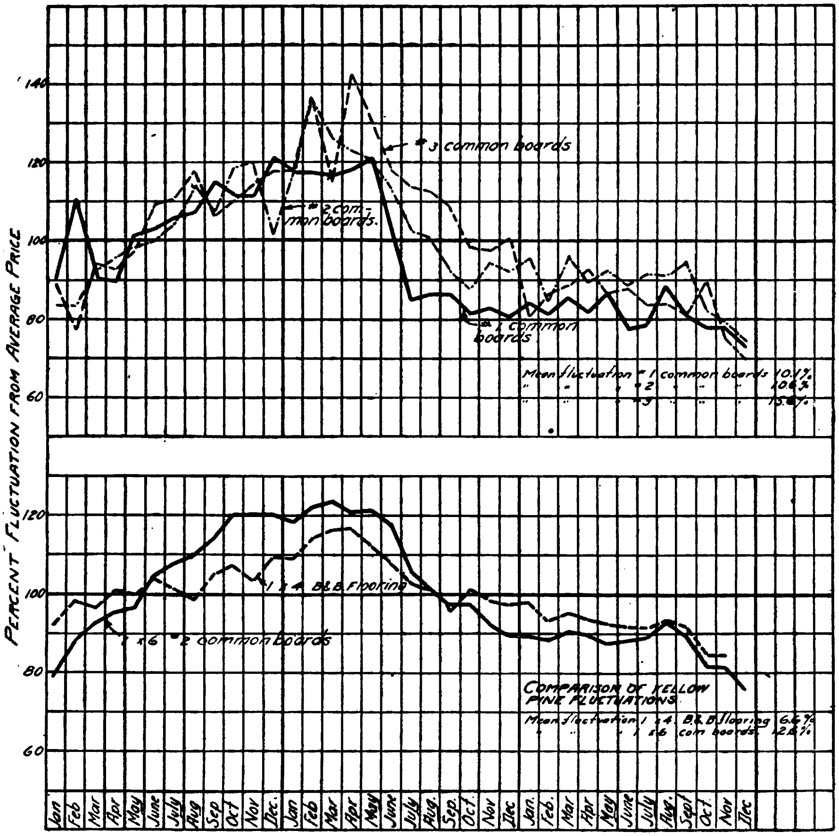


FIG. 21.—Comparison of yellow pine fluctuations.

To make a comparison of the conditions existing in different markets, fluctuations in the price of the same grade of Douglas fir at Minneapolis and Omaha have been plotted. (See fig. 22.) This comparison shows little difference in the conditions existing at these two centers. There was severe fluctuation in both cases, and local conditions seem to have had very little effect. This is borne out by a comparison of the actual prices of various grades of yellow pine

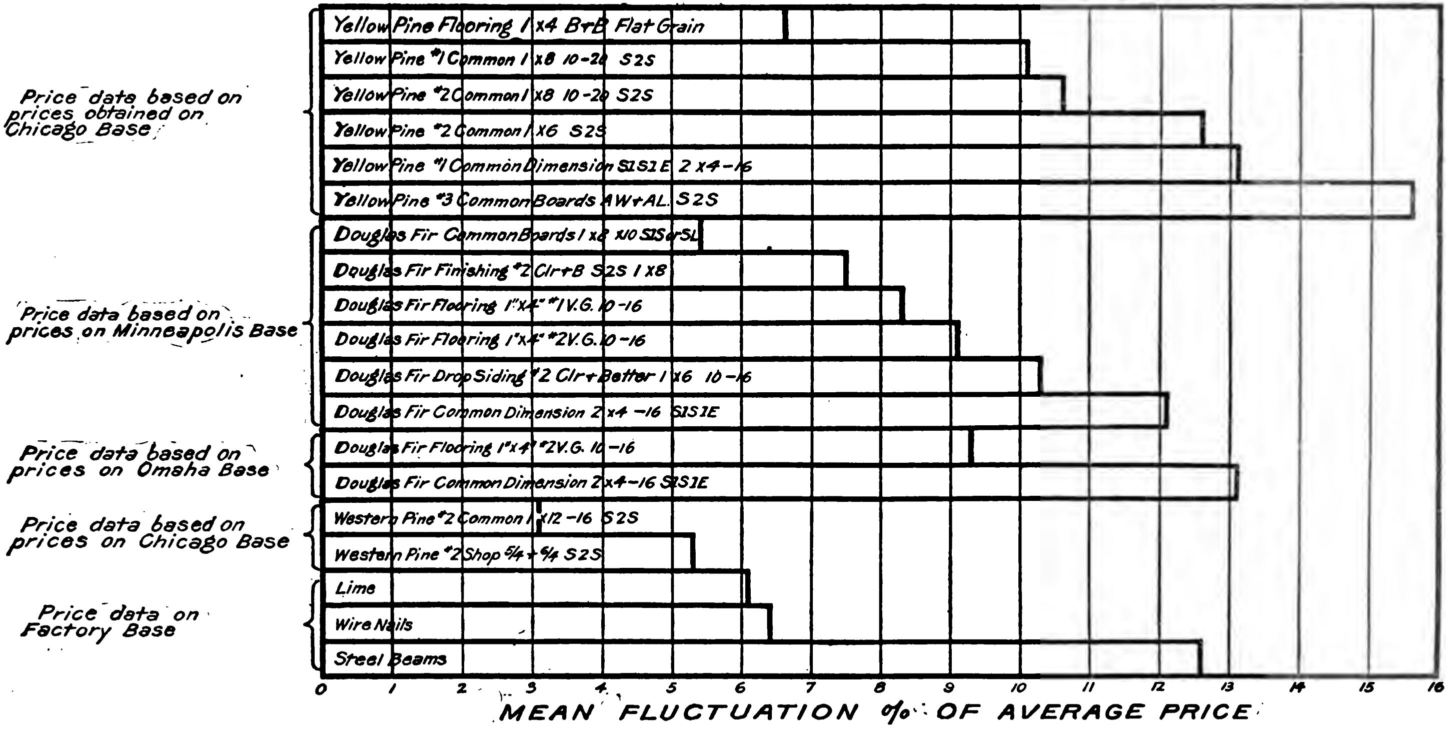


FIG. 21a.—Diagram illustrating the mean fluctuation in price of various grades and species of lumber from the average price of the grade during 1912, 1913, and 1914, and the mean fluctuation in price of lime, wire nails, and steel beams.

at Chicago and Kansas City. The data are comparable, since Chicago is on a 24 and 26 cent lumber freight rate, while most yellow-pine lumber is shipped into Kansas City on a 24-cent rate. The curves are very similar and show the same general tendency with only slight differences.

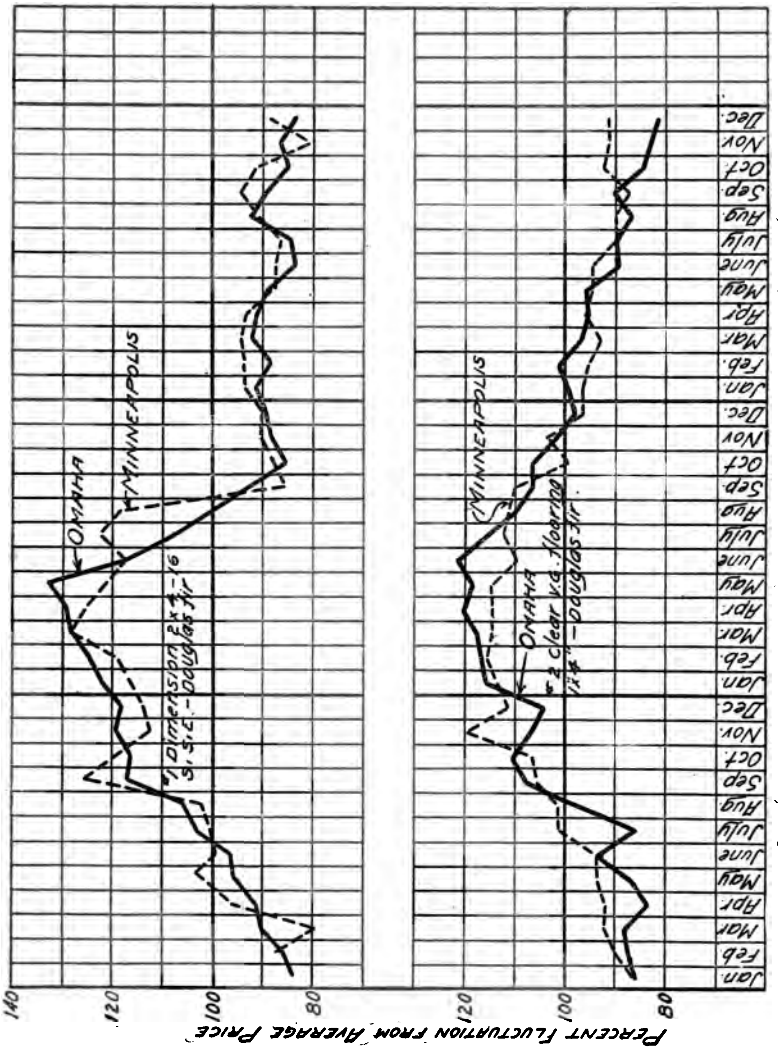


FIG. 22.—Comparison of fluctuations in different markets.

Reference has already been made to the fact that the price curves are based on the monthly average of a number of sales and do not reflect exactly the variations in the same wholesale market. This is best shown by plotting individual sale prices taken from the records of the companies. Variations are thus brought out in figure 23, giving actual prices at which sales of No. 2 Common boards 1×6 of southern yellow pine were made in the Chicago market. In figure 24 the same thing is shown on a percentage basis for No. 1 Common dimension 2×4—16 Douglas fir in the Omaha market. These two figures are significant in indicating the slight extent to which the grade price of lumber in the markets investigated followed a fixed or uniform line.

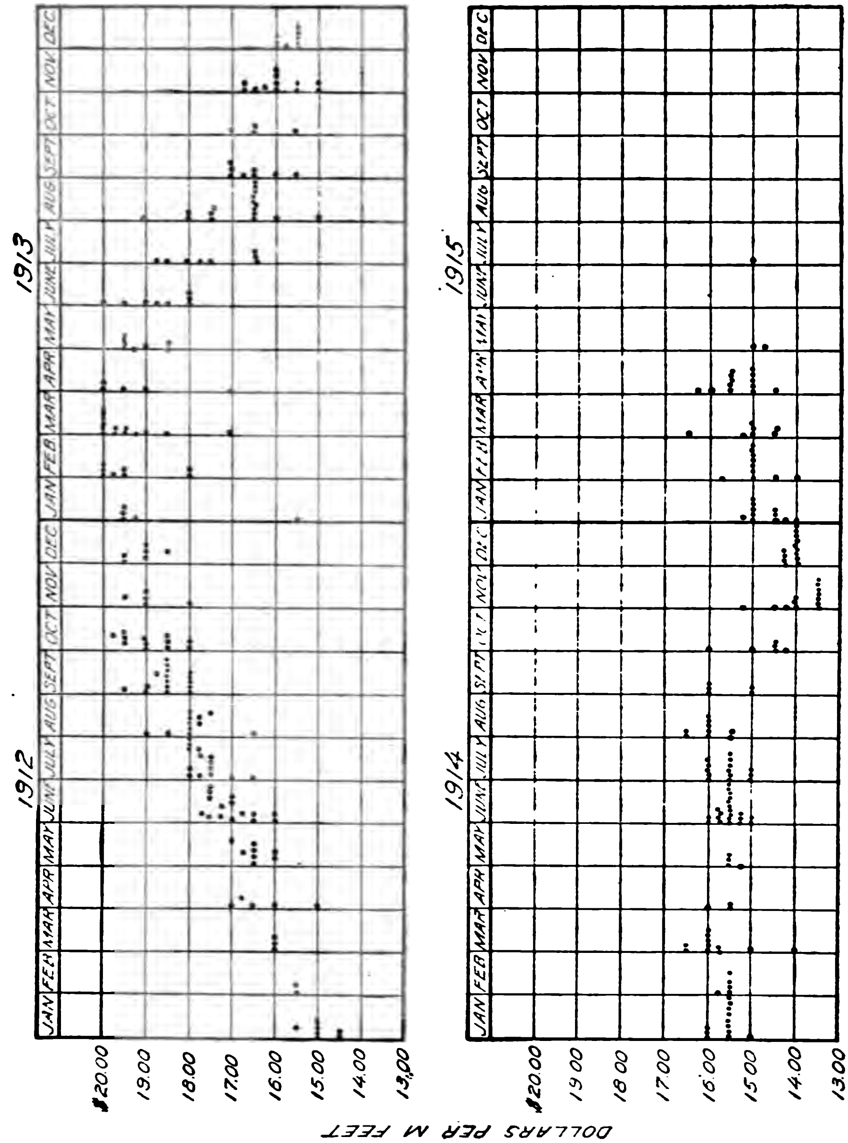


FIG. 23.—Actual wholesale prices at which No. 2 Common boards, 1×6—12-16 S. 2 S., southern yellow pine were sold at Chicago from 1912 to 1915. Each dot represents a specific sale.

FACTORS INFLUENCING CURRENT WHOLESALE PRICES.

This situation may be attributed to a number of factors, among which are competition in one form or another, wide variations in the quality of material falling within the same grade as influenced by different mill policies and graders, the financial responsibility of the buyer, the disorganized and diversified methods of wholesale merchandising, and the manipulation of grades. The price of lumber, like that of any other commodity, is what can be obtained for it. Tendencies toward irregular prices would be expected to become apparent at once in the case of a product whose quality value is classified in broad grades largely by personal judgment and arbitrary rules, and which is sold, in competition with itself and other building materials under different standards of use, by merchants competing under different methods of selling and under different moral, technical, and financial obligations.

VARIOUS ASPECTS OF COMPETITION.

Practically all forms of competition are reflected in price; hence in the

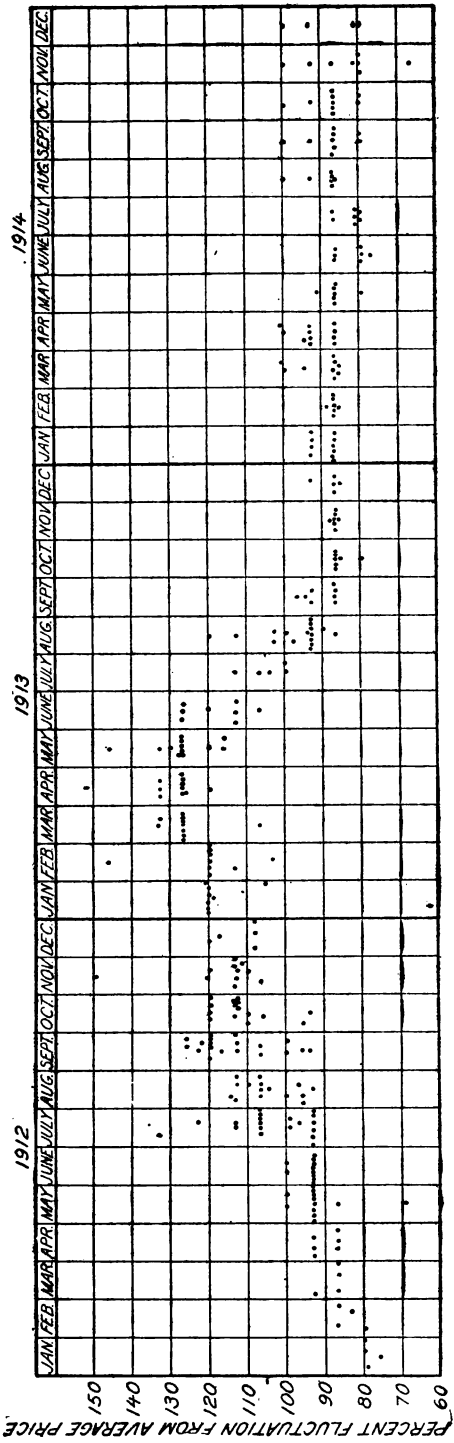


FIG. 24.—Per cent fluctuations in prices of Douglas fir No. 1 Common, dimension 2×4—16 S. 1 S. 1 E., from average wholesale price of current sales made at Omaha, Nebr., from 1912 to 1914.

daily or weekly lumber markets of large cities this force is constantly influencing prices not only through the varying outputs, policies, financial condition, and costs of production at good and poor mills, but also through the requirements of consumers, the use to which lumber is put, and the varying advantages in freight rates. For example, some mills maintain high standards of manufacture and grading but endeavor to obtain a better price than other mills whose standards are low and which follow a policy of loose grading. Again, mills or wholesalers knowing the requirements of a buyer will fix a price on a given grade or grades commensurate with the quality desired. Different prices on the same grade of material are often made to different purchasers, depending upon their financial rating, their reputation for prompt or slow pay, the size of the order, the buying specifications, and the strictness of purchasers' inspections. The nature of the order itself influences price. Many mills, particularly in the South, charge 50 cents per thousand feet more on mixed than on straight cars, because of the increased cost of loading the former. Again, the stocks on hand at the mills exert strong pressure upon price. When stocks of a given grade are low, the mill ordinarily holds for a higher price than if its stocks are heavy.

The methods of buying affect current sale prices indirectly through competition, as is illustrated by the following comparison of buying methods. A railroad, after an investigation of market conditions, places an order for a given grade of lumber with a mill or a wholesale company which it knows from experience will furnish a good quality of material. A second railroad at the same time advertises for bids on a similar grade of material and is quoted prices by a great number of sellers—commission men, wholesalers, mill agencies, etc. These men represent lumber varying in quality and standards of manufacture in the same grade. They likewise represent varying financial conditions, at the mills or within their own organizations, which at that particular time may be exerting strong influences upon the price quoted. Consequently in the bids submitted there may be a variation of several dollars per thousand feet. If the purchaser accepts the lowest bid, the price may be considerably less than that paid by the railroad first mentioned.

The purchaser in this case may receive lumber scaling to grade, but if the price quoted is exceedingly low he is likely to receive lumber correspondingly poor in quality. The latter may be a legitimate transaction if the purchaser knows what he is getting and the material is suitable for his purposes. There may, however, have been a blending of grades and misrepresentation of the quality of the stock offered.

Furthermore, transactions of this nature often contain elements of unfairness from a sales standpoint, in that different bidders may quote prices for the grade called for upon different standards. Grade manipulation may thus tend to offset competition in price, because the material offered under the same specifications but at different prices may not in fact be the same.

COOPERATIVE ACTIVITIES.

Numerous cooperative activities on the part of lumber manufacturers, like the organized collection and interchange of mill prices and the publication of association price lists and discount sheets, have tended to check competitive fluctuations in the wholesale market. The same is true of various informal local agreements and other attempts to maintain uniform prices. The effect of such forms of cooperation among lumber producers has been exceedingly variable both in different regions and at different times. It has depended upon the number and financial strength of the plants concerned, the quality and volume of their output, the pressure of timberland investments to increase mill capacity or maintain continuous production, the manufacturing conditions to be met, like the necessity for prompt shipment of some species and grades of lumber, and the condition of the market. Cooperation has usually been more effective when the demand for lumber is strong and prices are rising, and has largely been ineffective when opposite conditions prevail. All told, it has had but a relatively unimportant and localized effect in checking the competitive forces in the trade.

GRADE MANIPULATION.

The extent to which dishonest and deceptive methods in the form of grade manipulation or substitution, the raising of invoices, and similar transactions are practiced in the wholesale merchandising of softwood lumber in the Central States is impossible to determine without an exhaustive investigation of the entire field. Of the total volume of lumber sold daily in the different markets, a relatively small portion is probably subject to such practices, although it is generally admitted that a great volume of lumber goes through a so-called "ethical" blending of grades. This arises from a common custom of dealers to furnish material regarded as commensurate in price and quality with the purposes for which it is to be used, although not always conforming with the grades specified by the buyer. Sufficient specific data were obtained, however, to indicate that dishonest practices are much more common than should be the case.

It is undoubtedly true that many instances in which grade substitution is charged are not due to dishonesty on the part of the sellers, but to inherent conditions peculiar to lumber as a marketable product, such as errors in grading, latitude in the description of grades, changes in the quality of stock in transit, customs on the part of the seller in endeavoring to furnish the customer with lumber suitable for the purposes required, etc. Buyers who purchase through reputable concerns or who are familiar with grades and inspect shipments prior to acceptance ordinarily have little trouble in obtaining the quality of material desired.

Inquiries regarding grade manipulation were sent to a number of wood-using factories manufacturing sash, doors, blinds, and boxes. Of 89 replies, 83 reported that less than 10 per cent of their material was below grade; one reported 20 per cent and another 5 to 25 per cent as off grade; and the remaining four reported their purchases up to grade or above grade. Remanufacturers are, as a rule, sharp buyers, insisting upon certain specifications and inspecting their lumber closely. Once their requirements and policy are known, they apparently experience little difficulty. Where, however, a wholesale buyer purchases primarily for price, or where he is not strict as to quality or inspection—if he inspects at all—grade manipulation is more apt to occur. In fact, conditions in the lumber merchandising business, arising from ignorance of grades on the part of many buyers, from loose buying and selling methods, from lack of professional responsibility imposed upon sellers, from the failure of mills to adhere closely to grading standards, and from the ease with which grades can be manipulated, are such as to encourage sharp practices. In practically all the large centers studied reliable dealers admitted that these methods were employed to a greater or less extent by unscrupulous dealers whose competition it is difficult to meet. Grade manipulation takes many different forms, some of the more common being illustrated by the following examples, which are actual cases met in the course of the study.

Recently one of the large railway systems in the Middle West was quoted prices by a number of wholesalers on several cars of yellow pine No. 1 Common, car stock, and accepted an unusually low bid of $17 per thousand feet. When the material was received an official association inspection showed the shipment to contain 86,868 feet of No. 1 Common and 46,698 feet of No. 2 Common. In other words, 35 per cent of the shipment was off grade. The purchaser was allowed $93 in settlement of the claim. This was an instance where the seller, by mixing grades, had been able to quote a low price for No. 1 Common and thus obtain the business.

A mill in the West sold to a wholesale and commission lumber dealer a car of western pine shop invoiced as follows:

No. 1 Shop S2S.......	5,398 feet, at $28.10 per M.......	$151.68
No. 2 Shop S2S.......	14,931 feet, at 20.10 per M.......	300.11
No. 3 Shop S2S.......	2,073 feet, at 14.10 per M.......	29.23
	22,402	481.02

The above are prices f. o. b. mill. The car was reshipped by the wholesaler to a local point in Wisconsin, invoiced as follows:

No. 1 Shop S2S	7,398 feet
No. 2 Shop S2S	12,931 feet
No. 3 Shop S2S	2,073 feet

By arbitrarily changing the invoice and increasing the highest grade 2,000 feet, the wholesaler added $16, or the equivalent of 71 cents per thousand, to the mill value of the material.

A dealer in one of the large middle western cities regularly supplied a local wagon company with its lumber at prices upon which he made a reasonable profit, furnishing good quality of the grades required. Upon a recent order for a carload of yellow pine C flooring for wagon bottoms, the company was quoted a price of $23.75 per thousand feet by a competing dealer. This represented the cost price of material of the quality furnished by the first dealer; but despite this fact the first dealer agreed to meet the price. This he did by shipping a car containing 10,000 feet of C flooring, costing $23.75 per thousand, and 12,000 feet of D flooring, costing $20.75 per thousand, thereby making a profit of $3 per thousand on the D stock, or the equivalent of $1.63 per thousand feet on the entire order. This case well illustrates the effect of practices of this nature upon the purchaser, upon the trade, and upon the market price of a given grade, it being borne in mind that the entire shipment was sold to the company as C flooring.

A retailer in a small town in the Southwest ordered from a wholesaler a car of No. 1 Common Dimension 2×4 S. and E. yellow pine. The wholesaler included in the shipment several thousand feet of No. 2 Dimension, but invoiced and priced the material correctly as to the amounts of both grades. Upon receipt of the car at the retailer's yard the entire feetage was put in the No. 1 Dimension pile. The retailer did not know that a certain percentage was No. 2 Dimension until he subsequently examined the invoice. Nevertheless, the entire amount was sold from the retail yard as No. 1 Dimension at the No. 1 price.

A mill in the South obtained an order from a railroad for several hundred thousand feet of B and Better car siding, but did not have the material in stock. Being pressed for shipment before the lumber could be manufactured, the mill shipped the entire order in grade No. 1 Common, receiving the B and Better price. The material passed through the railroad shops without detection or complaint.

A catalogue house in the Middle West recently sold two house bills to purchasers in Ohio. The invoice in one case showed the bill to include 6,646 feet of No. 1 Common yellow pine, but an inspection of the material upon delivery showed this material to grade 52 per cent

No. 2 Common. In the other instance 10,443 feet were invoiced as No. 1 Common and the inspection upon delivery showed 21 per cent to be of No. 2 grade and 2 per cent to be of No. 3 grade.

Within the past year a city of the first class purchased over 1,101,000 feet of southern pine for construction work, the contract specifying No. 1 Common longleaf. The material was purchased through competitive bidding from a local wholesaler who placed the order with a wholesale lumber firm in the South. The difference between the total price bid by the lowest and successful bidder and the highest bidder was $4,346, or an average of $1.22 per thousand feet on all items. The largest single item was 144,000 feet, upon which the difference was $3.50 per thousand feet. Upon delivery, 319,667 feet were found to be loblolly and shortleaf pine instead of the longleaf specified, and an additional 46,684 feet was, owing to defect, No. 2 Common. In short, 33 per cent failed to meet the specifications under which the lumber was sold. In settlement of the claim, the seller accepted a reduction of 50 cents per thousand on the material which was not longleaf pine and $2.50 per thousand on the material which was below grade, the total reduction amounting to $275.71. The material was accepted by the city upon this settlement. In his report upon the case the commissioner of public works stated:

> I have learned that the city of ——— is not alone in receiving shortleaf and loblolly pine lumber under longleaf yellow pine specifications, but that this has been the case all over the country.

Entirely aside from the responsibility for this substitution and the technical question as to whether the material furnished was suitable for the purposes for which it was ordered, the case illustrates a practice which is more or less common among some lumbermen under competitive stress to ignore the buyer's specification for longleaf pine and bid upon the basis of supplying shortleaf and loblolly in whole or in part. From a merchandising standpoint it is not a desirable situation, a fact recognized by southern pine lumbermen, who are seeking to eliminate the practice by adopting more definite and reliable specifications for structural timbers.

These practices serve not only to cheat the consumer but to disrupt the market locally by establishing a fictitiously low price for the grade which has been manipulated. Furthermore, their very existence, whether to a great or small extent, in any particular market center, reacts upon the lumber-selling profession and upon the entire industry indirectly by developing lack of confidence in lumber on the part of the public. The elimination of these practices is essentially a problem for the industry itself. In the competition of the future it seems certain that unless lumber can be obtained with as definite assurance of quality as competing material, it will be under a great handicap in the merchandising field.

VARIATIONS IN DEMAND.

It has been the experience of those engaged in the trade that competition is keenest during periods of quiet demand and business depression, when both the volume and number of purchases fall off and stocks accumulate at the mills. It will be noted that during 1912 and the first six months of 1913, a period of 18 months, the fluctuations in wholesale prices in all cases were much more extreme and the general price level was much higher than during the subsequent period. Following June, 1913, the curves show that a rapid decline in wholesale prices set in, reaching its lowest point either during the last months of 1914 or the early months of 1915. Attention is called to the sudden decline in prices shown by practically all of the curves during the period immediately following August, 1914, the month in which war was declared abroad.

Most of the curves show a slight strengthening of the market during the early spring months of 1915, but there was practically no improvement in price conditions until the fall of 1915. Then a rapid rise occurred in the wholesale price of lumber, southern yellow pine increasing $3 to $5 per thousand feet and Douglas fir $2 to $3 per thousand feet. This in turn was followed by a downward reaction during the summer of 1916 and a strengthening of prices in the fall of that year. These changes in price are not shown by the curves, since the collection of data in the field terminated before they took place.

Assuming that competitive tendencies in point of number of dealers or marketing organizations remained practically the same during the period, it is clear that other conditions, external or internal, exerted tremendous periodic pressure upon wholesale market prices. A comparison of the trend of lumber prices with those of other products, given graphically in figure 18, shows similar fluctuations and establishes the fact that lumber prices in general are no different from those of other commodities in being subject to general business conditions throughout the country. Lumber is second only to steel in its response to changes in general business conditions. In short, the extreme fluctuations between 1912 and 1914 reflect clearly the effect of overproduction arising in part from general business and industrial depression.

This is shown even more specifically by figure 25, which gives the average monthly difference between the total production and shipments, in millions of feet, from January 1, 1912, to the end of September, 1915. The heavy curve directly reflects the stocks on hand during various periods of the years 1912, 1913, 1914, and 1915. The curve is based on monthly reports received by the National Lumber Manufacturers' Association from 450 to 807 representative mills operating throughout the country, and may therefore be taken as a fairly accurate index of existing conditions. Beginning with

1912, shipments began to exceed production and continued to do so until July, 1913, when a period during which production exceeded shipments began. Maximum stocks on hand are shown in the fall of 1914. The course of wholesale prices for several grades at three large consuming centers during the same period have been plotted in relation to this curve and show very strikingly the extent to which the price fluctuations conform to changing conditions in supply and demand. The direct influence which stocks on hand exert upon wholesale lumber prices is at once apparent. During periods of depression lumber stocks accumulate at the mills and prices are reduced by many mills in order to move the items of stock which are accumulating in the greatest volume.

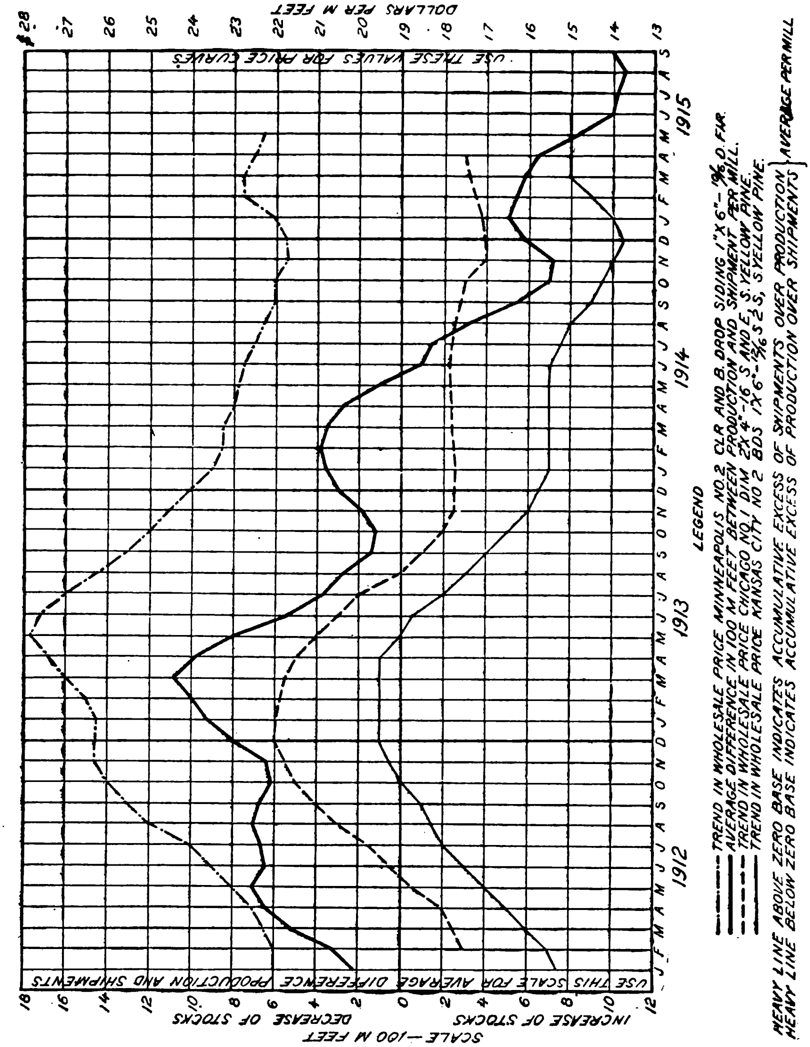


FIG. 25.—Relation between movement of lumber stocks at mills and wholesale prices at various market centers.

This pressure naturally forces or holds down wholesale prices until increased demands or reduced supplies release the pressure and prices are named on the basis of diminishing instead of accumulating stocks. It is undoubtedly true that the amount of stock on hand at the mills at the time sharp increases in demand occur largely determines the rapidity with which wholesale prices rise.

THE INFLUENCE OF OVERPRODUCTION.

The accumulation of stocks at certain periods, which is common in many industries, has been accentuated in the case of lumber by the well-nigh chronic overproduction of the most widely-used grades and species, which has been apparent since 1907. Many factors underlie this condition, including an excess of sawmill capacity, the pressure of timberland investments, and the extensive indebtedness of the industry. It has tended to depress lumber prices over considerable periods as compared with other commodities, and to make periods of rising prices when demands exceed the available supply comparatively short and infrequent.

SUMMARY OF PRINCIPAL CONCLUSIONS.

Wholesaling is an essential process in lumber distribution. The marketing of the output of the many thousand mills throughout the country presents problems equally important with those of manufacturing. Whether the selling function is performed by men employed directly by the manufacturers or by the independent wholesalers, public benefits and public approval will ultimately be measured by the ability of the industry as a whole to make the process efficient and economical, to reduce sharp practices to a minimum, and to insure service and quality of material to the buyer. Both types of organization possess special advantages in serving the public. At present only comparatively large and strong mills are able to maintain their own wholesaling organizations. Smaller mills, which greatly predominate in number, are largely dependent upon the middlemen for the disposal of a great part of their output, and in many instances for financial assistance.

During the past 15 years there has been a marked increase in the number of wholesalers, including jobbers, brokers, commission men, and mill salesmen. This increase has outstripped the increase in the consumption of lumber, and has undoubtedly resulted in increasing the average cost of wholesaling a thousand feet. This is due to the reduction in the average volume of business transacted by selling organizations and the added service furnished to their patrons. Out of these conditions has grown aggressive opposition on the part of many large mills to the independent wholesaler, more especially the commission man and broker. The past 5 or 10 years has been characterized by an increasing tendency on the part of wholesale consumers and retail dealers to buy directly from the lumber manufacturer. This movement seems attributable in part to the failure of the independent wholesaler in many instances to satisfy the consumer's needs as fully as he might. The practices of irresponsible wholesalers have also apparently reacted upon wholesalers generally.

Conditions in wholesale lumber merchandising easily permit sharp practices, because of ignorance of grades on the part of many buyers, loose buying and selling methods which have grown up with the trade, and a lack of business responsibility. The latter is not recognized by many sellers and has not been effectively imposed upon the seller by the industry. This condition has been accentuated by the failure of the mills in a great many instances to adhere closely to grading standards and by the ease with which grades can be manipulated. While but a relatively small proportion of the total amount of lumber marketed is subject to dishonest and deceptive selling practices, these practices nevertheless exist. They tend not only to cheat the consumer, but to disrupt the market by establishing fictitious grade prices. Furthermore, their existence reacts upon the entire industry by weakening confidence in its products.

The cost which the wholesaling process places upon a thousand feet of lumber is subject to wide variation, due to the many different types of organizations engaged in the trade, the different methods employed, the extent of the service rendered, the kind and amount of lumber sold, and the kind of trade sought. For these reasons the selling costs of different companies frequently are not comparable. An apparently high selling cost does not necessarily mean lack of efficiency, since the type of business transacted may return correspondingly high prices. Average costs of wholesaling can, therefore, be indicated only very broadly. Figures obtained from wholesale concerns located in the larger cities of the Middle West show an average gross spread for selling of around $1 per thousand feet, of which 75 to 80 cents represents operating expenses and 25 to 30 cents profit. These concerns maintain offices and salesmen, with the necessary office force. They include independent wholesalers as well as wholesalers with direct mill connections. Their businesses consist merely of selling the lumber for the mills and not of handling it through wholesale yards. Figures obtained from large mills selling all or a portion of their output through traveling salesmen indicate an average selling charge falling between 55 and 75 cents per thousand feet. These are actual operating costs and do not include profits on selling.

Of the delivered wholesale price of lumber, the figures obtained indicate that the manufacturer takes an average of from 50 to 75 per cent, the wholesaler from 2 to 5 per cent, and the railroads from 25 to 35 per cent. The amounts taken by the different factors in distribution, however, are subject to extreme fluctuations in individual sales or shipments, and this range of percentages holds only as a very broad average.

The data obtained unquestionably reflect competition in the wholesale merchandising of lumber. Wholesale prices at the large market centers studied fluctuate closely in conformity with mill prices. Low grades of lumber which move in the largest volume exhibit the most extreme fluctuations and reflect the greatest competition. Wholesale prices for specific grades and sizes of lumber cover a wide margin in the current market and are conspicuous by the absence of uniform and standard rates, especially during a declining market or periods of general trade depression. This lack of uniform prices is due to competition, combined with many peculiar industrial factors influencing lumber sales and grade standards and with the general business and financial conditions which affect the demand for lumber and its products.

Greater stability in current wholesale prices can undoubtedly be brought about by more uniform and scientific accounting and by more open trade practices which would permit more intelligent competition, in which the trade is not misled as to the quality or grade standards of the material sold. When the mixing of grades is required to meet a consumer's needs, it should be accomplished in a manner which will not obliterate grade standards and put confusion and uncertainty into grade prices. Deceptive grade manipulation should be eliminated.

APPENDIX.

TABLE 22.—*Distribution of principal softwoods.*

[Based upon data furnished chiefly by lumber manufacturers' associations for 1914 and 1915, covering about two-thirds of the total cut of softwood lumber.]

State.	Yellow pine.				Douglas fir, Oregon, Washington.		Hemlock, Wisconsin, Michigan.		North Carolina pine, Virginia, North Carolina, South Carolina.		Spruce and hemlock, West Virginia.	
	Missouri, Oklahoma, Arkansas, Texas, Louisiana, Mississippi, Alabama.		Georgia, Florida.									
	Cars.	Per cent.	Cars.	Per cent.	Cars.	Per cent	Cars.	Per cent.	Cars.	Per cent.	Cars.	Per cent.
Alabama	19,118	3.79										
Arizona	958	.19			3,750	1.25						
Arkansas	15,738	3.12										
California					60,000	20.00						
Colorado	4,086	.81			7,500	2.50						
Connecticut	706	.14	190	0.24	300	.10			6,617	4.47		
Delaware	1,009	.20	1,792	2.26	30	.01			1,495	1.01		
District of Columbia									2,443	1.65		
Florida			9,920	12.51								
Georgia			3,925	4.95								
Idaho					6,000	2.00						
Illinois	63,257	12.54	1,951	2.46	9,000	3.00	13,288	24.16	45	.03		
Indiana	22,851	4.53	975	1.23	1,350	.45	2,123	3.86	75	.05		
Iowa	15,537	3.08			12,000	4.00	2,727	4.96	15	.01		
Kansas	36,572	7.25			4,500	1.50						
Kentucky	8,323	1.65	936	1.18	450	.15			45	.03		
Louisiana	23,255	4.61			15	.005						
Maine					45	.015			1,258	.85		
Maryland	656	.13	2,592	3.27	90	.03			7,343	4.96	355	2.50
Massachusetts	1,412	.28	5,662	7.14	600	.20			4,530	3.06		
Michigan	11,804	2.34	10,102	12.74	3,000	1.00	6,919	12.58	252	.17		
Minnesota	1,513	.30			13,500	4.50	2,695	4.90				
Mississippi	15,184	3.01										
Missouri	46,358	9.19	270	.34	4,500	1.50	17	.03				
Montana					8,250	2.75						
Nebraska	21,993	4.36			13,500	4.50	5	.01				
Nevada					1,500	.50						
New Hampshire	504	.10	95	.12	45	.015			429	.29		
New Jersey	2,018	.40	4,496	5.67	465	.155			12,910	8.72	1,732	12.20
New Mexico	2,320	.46			795	.265						
New York	3,279	.65	12,196	15.38	1,470	.49	2,629	4.78	30,423	20.55	1,135	8.00
North Carolina									5,907	3.99		
North Dakota					13,500	4.50						
Ohio	23,406	4.64	975	1.23	1,050	.35	3,372	6.13	3,227	2.18	213	1.50
Oklahoma	31,073	6.16			51	.017						
Oregon					21,000	7.00						
Pennsylvania	7,012	1.39	9,563	12.06	1,260	.42	3,416	6.21	45,079	30.45	5,499	38.75
Rhode Island	656	.13	761	.96	90	.03			1,125	.76		
South Carolina									3,597	2.43		
South Dakota	2,270	.45			12,750	4.25	94	.17				
Tennessee	7,819	1.55	1,063	1.34								
Texas	49,788	9.87			105	.035						
Utah					9,000	3.00						
Vermont					150	.05			118	.08		
Virginia					9	.003			16,152	10.91		
Washington					39,000	13.00						
West Virginia	706	.14	1,887	2.38	60	.02			3,879	2.62	3,697	26.05
Wisconsin	4,237	.84			4,500	1.50	17,715	32.21				
Wyoming					3,000	1.00						
Canada					10,320	3.44						
Foreign	48,023	9.52	9,944	12.54	27,000	9.00			1,081	.73	1,561	11.00
Mexico	10,997	2.18			4,500	1.50						
Total	504,438	100.00	79,295	100.00	300,000	100.00	55,000	100.00	148,045	100.00	14,192	100.00

TABLE 22.—*Distribution of principal softwoods*—Continued.

State.	Western pine, Idaho, Montana, Eastern Oregon, Washington.		Northern pine, Minnesota, Wisconsin, Michigan.		Redwood, California.		Larch and pine, Montana, Idaho.		Total.	
	Cars.	Per cent.	Cars.	Per cent.	Cars.	Per cent.	Cars.	Per cent.	Cars.	Per cent.
Alabama									19,118	1.53
Arizona									4,708	.38
Arkansas									15,738	1.26
California	6	0.01			15,567	87.64			75,573	6.05
Colorado	2,665	4.23			23	.13	7	0.09	14,281	1.14
Connecticut	31	.05	294	0.49	7	.04			8,145	.65
Delaware							4	.06	4,330	.35
District of Columbia			6	.01					2,449	.20
Florida									9,920	.74
Georgia									3,925	.32
Idaho	4,511	7.16							10,511	.84
Illinois	3,566	5.66	7,566	12.61	53	.30	.30	.39	98,756	7.91
Indiana	113	.18	396	.66	45	.25			27,928	2.24
Iowa	4,316	6.85	13,770	22.95	21	.12	230	2.98	48,616	3.89
Kansas	252	.40	12	.02	18	.10			41,354	3.31
Kentucky									9,754	.78
Louisiana									23,270	1.86
Maine									1,303	.11
Maryland	6	.01	6	.01			6	.08	11,054	.89
Massachusetts	1.279	2.03	96	.16	5	.03	4	.05	13,588	1.09
Michigan	618	.98	1,290	2.15	29	.16			34,014	2.72
Minnesota	6,319	10.03	20,496	34.16	11	.06	492	6.39	45,026	3.60
Mississippi									15,184	1.22
Missouri	384	.61	36	.06	34	.19			51,599	4.13
Montana	11,031	17.51					5,509	71.48	24,790	1.99
Nebraska	3,503	5.56	84	.14	11	.06	56	.73	39,152	3.13
Nevada	25	.04			14	.08			1,539	.12
New Hampshire									1,073	.09
New Jersey	82	.13	162	.27	18	.10	7	.09	21,890	1.75
New Mexico									3,115	.25
New York	1,953	3.10	9,300	15.50	46	.26	9	.12	62,440	5.00
North Carolina									5,907	.47
North Dakota	5,317	8.44	636	1.06			987	12.81	20,440	1.64
Ohio	1,027	1.63	1,668	2.78	37	.21	11	.14	34,986	2.80
Oklahoma	31	.05	6	.01	11	.06			31,172	2.50
Oregon	743	1.18			1	.01			21,744	1.74
Pennsylvania	1,922	3.05	324	.54	34	.19	22	.28	74,131	5.93
Rhode Island	6	.01			4	.02	2	.02	2,644	.21
South Carolina									3,597	.29
South Dakota	4,278	6.79	24	.04	5	.03	190	2.47	19,611	1.57
Tennessee									8,882	.71
Texas									49,893	4.00
Utah	1,632	2.59			16	.09			10,648	.85
Vermont									268	.02
Virginia			36	.06					16,197	1.30
Washington	3,081	4.89			1	.01			42,082	3.37
West Virginia			12	.02					10,241	.82
Wisconsin	3,175	5.04	3,780	6.30	30	.17	39	.51	33,476	2.68
Wyoming	775	1.23			5	.03	79	1.02	3,859	.31
Canada	347	.55					22	.29	10,689	.86
Foreign	6	.01			1,716	9.66			89,331	7.15
Mexico									15,497	1.24
Total	63,000	100.0	60,000	100.00	17,762	100.00	7,706	100.00	1,249,438	100.00

TABLE 23.—*Illustrative freight rates in cents per 100 pounds.*

Species.	New York.	Boston.	Philadelphia.	Baltimore.	Pittsburgh.	Detroit.
Yellow pine	25-33	28-37	21-31	20-30	26-31	26-30.7
Douglas fir	75	75	73	72	68	64
White pine:						
Menominee, Mich	25	27	23	22	17	10
Bay City, Mich	22.2	24.2	20.2	19.2	14.7	7
Hemlock: [1]						
Wausau, Wis	29.5	31.5	27.5	26.5	23.7	19.5
Emporium, Pa	13.7	15.8	13.1	12.1	10.5	14.4
North Carolina pine [2]	13.7	15.8	9	8	16	17
Spruce, W. Va. [3]	19	21.5	17	16	15	16
California redwood and pine	75	80	75	75	70.5	66.5

Species.	Cincinnati.	Chicago.	St. Louis.	Kansas City.	Denver.	Omaha.	Minneapolis.
Yellow pine	19.5-23	22-26.5	19-24	17-24	....	....	....
Douglas fir	64	55	55	50	40	50	45
White pine:							
Menominee, Mich	....	8.5	....	....	....	....	....
Bay City, Mich	....	10.5	....	....	....	....	....
Hemlock: [1]							
Wausau, Wis	....	10	....	....	....	....	....
Emporium, Pa	....	....	....	....	....	....	....
North Carolina pine [2]	16	20	24	....	....	....	....
Spruce, W. Va. [3]	14	19	....	....	....	....	....
California redwood and pine	66.5	60	55	50	....	....	....

NOTE.—Inland Empire shipments take a differential of 3 cents per hundred pounds under those quoted for Douglas fir.

[1] Hemlock from West Virginia, North Carolina, and Tennessee also reaches Atlantic seaboard cities on a rate to Philadelphia of from 17 to 24 cents and with relative rates to other cities.

[2] Rates from Norfolk, Va., are water competitive.

[3] Adirondack spruce reaches New York on a rate of 13.7. Maine and Canadian spruce moves to Boston and New York by water.

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PUBLICATIONS ON THE LUMBER INDUSTRY.

A study of conditions in the lumber industry was conducted by the Forest Service of the United States Department of Agriculture, in cooperation with the Bureau of Corporations and the Federal Trade Commission, during 1914 and 1915. Its object was to obtain and place before the public in a constructive way the essential facts regarding this industry and their bearing upon forest conservation. As part of the cooperative plan an investigation of the export lumber trade was undertaken by the Bureau of Foreign and Domestic Commerce.

The following are bulletins on the lumber industry which the Department of Agriculture plans to publish:

Some Public and Economic Aspects of the Lumber Industry. By William B. Greeley, Assistant Forester.

A summary of the study, compiled largely from data obtained by the authors of the more detailed reports dealing with particular regions or phases of the lumber industry.

Forestry and the Lumber Industry. By Henry S. Graves, Forester.

A résumé of the practice of forestry in the United States; the methods of forestry applicable under varying economic and industrial conditions; the public aspects of private forestry; and the place of forestry in the lumber industry.

Timber Ownership and Lumber Production in the Southern Pine Region. By C. Stowell Smith, formerly Assistant District Forester.

Timber Ownership and Lumber Production in the Douglas Fir Region. By Austin Cary, Logging Engineer.

Timber Ownership and Lumber Production in the Inland Empire. By David T. Mason, Professor of Forestry at the University of California, formerly Assistant District Forester in the Forest Service.

Timber Ownership and Lumber Production in California. By C. Stowell Smith, formerly Assistant District Forester.

These four reports deal with the standing timber in the regions having the largest supply, the cost and value of stumpage, costs and returns in lumber manufacture, and the conditions existing in timber ownership and lumber production.

Public Timber and Its Use. By William B. Greeley, Assistant Forester.

A synopsis of the origin and history of the public timberlands, their present extent and character, their use under existing laws and regulations, and the policies which should govern their administration.

The Distribution of Softwood Lumber in the Middle West. Wholesale Distribution. By Ovid M. Butler, Assistant Director Forest Products Laboratory

The Distribution of Softwood Lumber in the Middle West. Retail Distribution. By Ovid M. Butler, Assistant Director Forest Products Laboratory.

A study of lumber wholesaling and retailing in 11 of the Central States, including their costs and returns, retail and wholesale prices, lumber freights, and the division of the retail price of lumber among the various agencies concerned in its manufacture and distribution.

The Utilization of Low-Grade Lumber and Mill Waste. By Howard F. Weiss, formerly Director of the Forest Products Laboratory.

A study of the amount of low-grade lumber now produced and of mill waste, their bearing upon lumber manufacture, and possible means of putting them to more profitable use for paper, distillates, and other by-products.

The Substitution of Other Materials for Wood. By Rolf Thelen, Engineer in Fores Products.

A brief historical and statistical résumé of the replacement of wood by other structural materials.

The Adaptation of Lumber Manufacture and Grading to the Requirements of Consumers. By Harold S. Betts, Engineer in Forest Products.

A study of the possibilities of greater efficiency in adapting lumber manufacture to the ultimate use of the product and the specific needs of various classes of consumers.

The Department of Commerce also has in preparation a bulletin on "The Exportation of American Lumber," by Dr. Edward E. Pratt, Chief of the Bureau of Foreign and Domestic Commerce.

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